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Award-winning CEOs and corporate innovation

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ABSTRACT

We examine the role of award-winning CEOs in corporate innovative activities. We find no significant difference in innovation outputs between firms of media award-winning CEOs and a matched sample of predicted winners. However, firms headed by winners of non-media awards generate significantly more patents and citations in the second and third year after the award. Firms led by CEO-winners of media awards attract more interest in Google and see an increase in the number of financial analysts that follow them. These effects likely exert more pressure on managers to meet short-term goals and hence impede the firms' innovation. We do not find the same effects for firms that have CEOs who win non-media awards. The latter category sees an improvement in employee treatment following the award year. These different channels explain why innovation only increases for firms that are headed by CEOs who win non-media awards.

1. Introduction

Innovation has become increasingly important as a major engine of economic growth. The empirical literature has identified a number of company characteristics that drive innovation.[1] The major push for innovation should start with the CEO of a company. Indeed, a global survey by PwC (2011) finds a general belief amongst CEOs that the drive to innovation should start at the top. The survey calls it a "misconception" that innovation can be delegated. The CEO and the executive leadership have to create a culture that is open to new ideas and nourishes as well as rewards fresh thinking. In this sense, even though top executives have little direct influence over innovation, they play an essential role in creating an environment that extracts the most value from the firms' human capital, leading to corporate innovation success. The academic literature documents several characteristics of top executives that can affect corporate innovative activities, such as CEO overconfidence (Galasso and Simcoe, 2011; Hirshleifer et al., 2012), networking (Faleye et al., 2014), and managerial ability and skills (Chen et al., 2015; Custodio et al., 2019). Since CEO characteristics are important to innovation success, a change in CEO attributes could also lead to a change in firm innovation activities.

The status of a CEO is a factor that has the potential to influence innovation. This status can be enhanced by CEOs winning awards. There is a strand of literature that documents the status effect induced by chief executive officers (CEOs) winning media awards and how it influences stock returns and operating performance (Wade et al., 2006; Malmendier and Tate, 2009; Ammann et al., 2016). Thanks to the increase in media visibility after winning a media award, CEOs increase their status and can gain more trust from stakeholders and enjoy more favorable business deals. These advantages are important for CEOs in pursuing innovative projects, which are risky and require a high investment. However, there is also a downside to winning media awards. Malmendier and Tate (2009) find that the superstar CEOs, who are the winners of media contests, often become the center of attention following their awards. These CEOs end up spending more time on activities outside the company, such as writing books or sitting on outside boards. In addition, they often end up spending more time on leisure activities. Therefore, it may be possible that the positive effect of status on innovation will be undone by this "burden of celebrity".

In this paper we investigate the effect of winning both media and non-media awards on corporate innovation. Because of the earlier mentioned potential negative effects of winning media awards, we also utilize a set of non-media awards to study their effect on corporate innovation. Using non-media awards helps improve the accuracy of our test of the role of award-winning CEOs in corporate innovation performance. Our study is aligned with the work of Ammann et al. (2016), who

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[1] For example, corporate governance (Sapra, Subramanian and Subramanian, 2014)), analyst following (He and Tian, 2013), stock liquidity (Fang, Tian, and Tice, 2014), non-executive employee stock options (Chang, Fu, Low, and Zhang, 2015), and corporate transparency (Zhong, 2018; Brown and Martinsson, 2019).

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investigate the performance and innovative activity of companies as competitors of either winners or predicted winners.[2] Instead, our paper focuses on winners by comparing them with predicted winners. Therefore, Ammann et al. (2016) study the indirect effect of the awards by looking at the effect on those who do not win awards. We study the direct effect of the actual winners.

We find no significant increase in corporate innovation outputs for media award-winning CEOs compared to a matched sample of non-winners (predicted winners). On the other hand, firms headed by winners of non-media awards generate, on average, 38.8% more patents and 71.2% more citations per patent in the 2nd year following the award year, further increasing to 48.1% more patents and 91.5% more citations in the 3rd year following the award. Additional tests show that non-media awards are associated with more patents and innovations compared to media awards.

Growth opportunities can contribute to innovation performance. In line with this argument, we find that firms led by award winners are associated with more growth opportunities, due to the increase in status following the award. We find that winners of both types of awards, media and non-media, are associated with an increase in growth opportunities.

We further investigate why the effect on innovation for media and non-media awards is different. We first study the potential effect of awards on CEO distraction. Following Da et al. (2011, 2015) we use the abnormal changes in the Search Volume Index (SVI) in Google as a measure of market attention. Our results show a significantly positive Abnormal Search Volume Index (ASVI) in the first four weeks following media awards. It is likely that this higher CEO visibility is associated with the CEO distraction documented by Malmendier and Tate (2009). Non-media awards, on the other hand, are only associated with a significantly positive ASVI in the first week following the award week. As a second channel we study analyst coverage. He and Tian (2013) find that firms covered by more financial analysts generate less innovation outputs. They suggest that more analysts following the firm lead to short-term pressure on managers to deliver higher earnings. Therefore, managers are likely to postpone investments and focus on the short run rather than the long run. Our results confirm this line of thinking. We find a significant increase in analyst coverage following media awards, whereas there is no increase in analyst coverage for non-media awards. For the third channel we look at the impact of winning awards on employee treatment. Chen, Leung, and Evans (2016) and Chen, Chen, Hsu, and Podolski (2016) document that firms with an employee-friendly workplace have greater success in innovations. We find an improvement in employee treatment for non-media awards, contributing to the explanation for increasing innovation outputs for these awards. On the other hand, there are non-significant coefficients for the media awards. Furthermore, we look at innovation characteristics. Here we find that firms of CEOs who win non-media awards significantly increase their patent originality, while firms of CEOs who win media awards do not significantly change the originality of their patents. Finally, CEOs of firms that win non-media awards also attract significantly more talented innovators compared to media award winning firms.

Our results are consistent with the view that firms led by media award-winning CEOs do not always engage in more innovative activities because of the special nature of innovation activities and the "burden of celebrity." After all, innovation is a high-risk activity that requires a long-term commitment of corporate resources and managerial talent (Holmstrom, 1989). Firms led by non-media award winners appear to benefit from the same status-increasing positive effect as media award winners, but with less of the outside attention and distractions that the "burden of celebrity" brings. Therefore, induced by the status change following the victory of CEO personal awards, firms led by non-media award winners can benefit from the CEO's reputation and networking to attract the best talent and enjoy more favorable business commitments for risky projects. These benefits make investments in innovation more accessible and eventually boost the innovative activities of firms with non-media award-winning CEOs.

Our study is the first to utilize a unique set of CEOs' non-media awards in investigating firm innovation outcomes. Since status changes following non-media award competitions can affect various corporate decisions and stakeholder behaviors, the findings of this study provide a potentially fruitful avenue for future research that investigates stakeholders and corporate outcomes in a non-media setting.

This study also sheds more insight on the literature examining CEOs in the media (see Wade et al. (2006), Malmendier and Tate (2009), and Ammann et al. (2016)). Our paper suggests that changes in CEO status following award competitions also matter in corporate innovative activities. We provide new evidence on the role of CEO personal traits in corporate innovation. The finding contributes to the broader literature that explores how life, career experience, and personal attributes affect CEO style and corporate decisions (Malmendier et al., 2011; Custodio et al., 2013; Benmelech and Frydman, 2015; Dittmar and Duchin, 2015; Bernile et al., 2017; Cronqvist and Yu, 2017).

2. Hypothesis development

Based on the prior literature, we expect that winning an award will have two major consequences for a CEO. First, the CEO power, influence and ability to attract investors and innovators will increase. This effect will be present for both media and non-media awards. Potentially, this extra CEO power can translate into long-term positive effects for a firm, such as the ability to attract inventors, being able to focus on long-term goals and promote a healthy working environment in a company.

On the other hand, we expect that winning a media award comes with extra media attention that imposes a set of additional pressures (as well as opportunities) on a CEO to deliver short-term results and visibility. Media-winning CEOs are likely to choose the most cost-efficient ways to satisfy this media attention. Sometimes, this might be a short-term increase in stock returns, while other times it will be joining additional boards or writing a book (activities that detract from working and creating value for a company).

Overall, considering the positive (CEO power) and negative (media attention) aspects of winning an award, our first three hypotheses are as follows. First, firms led by the non-media award winning CEOs will get the benefits of CEO power but no distractions from media attention. Therefore, we expect to observe only the improvements in the long-term outcomes compared to non-winners:

H1: *Firms led by non-media award-winning CEOs generate more ex post innovation output than the matching firms of non-winning CEOs.*

Secondly, firms led by media award winners may have better or worse outcomes compared to non-winners. If the effects of CEO power dominate the media distraction, the innovation performance is expected to improve. If the media effects are stronger, we expect the opposite to happen:

H2A: *Firms led by media award-winning CEOs generate more ex post innovation output than the matching firms of non-winning CEOs.*

H2B: *Firms led by media award-winning CEOs generate less ex post innovation output than the matching firms of non-winning CEOs.*

Finally, since firms led by the non-media awards winners receive the same CEO power benefits but no additional negative effect of media distractions, we expect them to do better (controlled for their peers) relative to the media award winners:

H3: *Increase in ex post innovation output (compared to the matching firms of non-winning CEOs) is higher for firms led by non-media award-winning CEOs than for firms led by media award-winning CEO.*

[2] Ammann et al. (2016) find an increase in the risk taking and innovation activity of the competitors of award-winning CEOs, which is associated with a significant positive stock market performance of those competitors subsequent to the award.

We further identify four channels that are likely to deliver these results: media attention, analyst coverage, employee satisfaction, and inventor attraction. We expect that the first two (media attention and analyst following) will be the strongest for the media awards, whereas employee satisfaction and an increase of the number of inventors are more in line with the CEO power hypothesis. Therefore, observing differential results between media and non-media awards for these channels would support our expectations about the key impacts of the awards as described above.

2.1. Market attention for the CEO

CEO media awards are expected to broaden CEOs' media visibility as well as enhance their status and power within the firm (Malmendier and Tate, 2009). This status effect impacts firm innovation activities in several ways. *First*, the increasing media exposure following a CEO's media award announcement could shift power toward award-winning CEOs, hence boosting their risk-taking attitude and even encouraging their overconfidence. Prior literature has shown that firms led by overconfident CEOs tend to achieve higher innovation outputs (Galasso and Simcoe, 2011; Hirshleifer et al., 2012). It is, therefore, possible that award-winning CEOs are more likely to lead their firm to innovation success. *Second,* award-winning CEOs, with increased reputation from receiving awards, are likely to be more trusted by shareholders and other stakeholders (Baik et al., 2011; Demerjian et al., 2012). These CEOs are therefore less likely to be discouraged from investing in risky innovation projects within the context of career concerns because their reputation can signal their superior managerial skills (Narayanan (1985)). In addition, winning a media award signals investors and other firm stakeholders that the company is being managed by a capable CEO. Greater trust can thus result in lower financing costs and more favorable business contracts, making investments in innovation easier for firms led by media award-winning CEOs. *Third,* being granted an award offers CEOs more opportunities to build widespread networks, which add value to firm innovation by facilitating investments in corporate innovation, as suggested by Faleye et al. (2014). These three effects are all expected to lead to a positive relation between award winning and innovation for both media and non-media awards.

However, a high status from winning media awards does not necessarily guarantee innovation success. A strong reputation is associated with heightened performance expectations, consequently, these expectations could act as a "natural brake" on the unfettered accumulation of CEO power, prestige, and compensation (Fombrun, 1996). While increased media exposure following a CEO's award can boost firm profitability, it can also shift power towards the CEO and induce perquisite consumption in the spirit of Jensen and Meckling (1976). Malmendier and Tate (2009) show that media award-winning CEOs, who become the center of attention following prestigious media awards, often spend more time on activities outside the company, such as writing books, sitting on outside boards, and spending more time on leisure activities. They are also more likely to engage in earnings management to "maintain expected superstar performance as long as possible" (Malmendier and Tate, 2009, p4). Therefore, media award-winning CEOs subsequently underperform relative to non-winning CEOs (Wade et al., 2006; Malmendier and Tate, 2009; Ammann et al., 2016). We expect the distractions and pressure to have a negative impact on companies under the lead of media award-winning CEOs because of extreme media exposure.

The situation for non-media awards is different. We do not expect them to attract the same amount of attention as media awards, so they will not have either the positive nor the negative effects of this increased attention. Therefore, the following hypotheses only refer to media awards.

H4: *Firms led by media award-winning CEOs received increased media attention compared to the matching firms of non-winning CEOs.*

2.2. Analyst coverage

Financial analysts play important roles in producing information for the firms they cover and providing performance benchmarks such as stock recommendations or earnings forecasts (Frankel et al., 2006; Mohanram and Sunder, 2006; Soltes, 2014; Brown et al., 2015; Huang et al., 2017). With a focus on firm creative activities, He and Tian (2013) document that firms covered by a larger number of financial analysts generate fewer innovation outputs. The authors suggest that a larger number of analysts following a firm impose short-term pressure on managers and exacerbate managerial myopia. Managers, in response to such pressure, boost current earnings by passing up long-term investments in risky and innovative projects, eventually resulting in less innovation success (He and Tian, 2013). By examining the decision of an analyst to follow firms, O'Brien and Bhushan (1990) suggest that analysts tend to follow firms with more potential sources of information or with a lower cost of information collection. CEOs, after winning an award, can receive disproportionate attention from clients, competitors, and the media, making their information and performance attractive to financial analysts, which may induce more analyst coverage. Motivated by the seminal work of He and Tian (2013) and a strand of literature examining the roles of analysts in generating corporate-related information, we examine the potential impact of winning CEO awards on analyst coverage. We expect that this effect will only occur for media-awards, since they provide greater visibility. Hence, our next hypothesis:

H5: *Firms led by media award-winning CEOs receive increased analyst following, leading to a potential focus on short-term results, compared to the matching firms of non-winning CEOs.*

2.3. Employee satisfaction

Opportunities to work with an award-winning CEO can attract the best talent. Prior research shows that non-CEO top management team members receive higher pay when they work for a high-status CEO (Graffin et al., 2008). Since employee compensation and treatment are important factors affecting innovative success (Chang et al., 2015; Chen et al., 2016a, 2016b), we can expect firms led by award-winning CEOs to be attractive destinations for the best talent, which is an engine to drive corporate innovation success. We expect this effect to be restricted to non-media award winning CEOs, because the media award winning CEOs will be too distracted by activities outside their company and/or too focused on short-term results. Our hypothesis is as follows:

H6: *Firms led by non-media award-winning CEOs experience increased employee satisfaction compare to the matching firms of non-winning CEOs.*

2.4. Inventor attraction

Changes in CEO status may lead to better possibilities to attract talented inventors. We hypothesize that award winning CEOs generate more innovation outputs after winning their awards because of their increased possibilities to attract inventors. We expect this effect to be restricted to non-media award winning CEOs, because the media award winning CEOs will be too distracted by activities outside their company and/or too focused on short-term results:

H7: *Firms led by non-media award-winning CEOs will be more successful in attracting inventors compared to the matching firms of non-winning CEOs.*

2.5. Summary of hypotheses

Overall, we expect a positive effect of non-media award winning for CEOs on innovation. The increase in status will help the CEO to create better employee satisfaction and will be useful in attracting inventors. The situation for media award winning CEOs is less clear. They will also experience an increase in status, but that will come with a burden of celebrity. This burden is exclusive for media winning CEOs because they

will be more in the spotlight. In addition, we expect that these CEOs will be more focused on short-term results because they will be more closely followed by financial analysts.

3. Data description

3.1. Data on CEO awards

We examine the impact of award-winning CEOs on the performance of corporate innovation activities. We obtain a full list from ExecuComp's Standard & Poor's 1500 firms and their CEOs for the period 1992–2019. We rely on the most up-to-date patent application and citation data from Kogan et al. (2017), who collect all patent data from Google Patents for the period 1926–2019. We end our innovation sample in 2017 to address truncation biases associated with innovation data (Hall et al., 2001, 2005). We start our award sample in 1993 (instead of 1992, when the ExecuComp database begins) because we use one-year-lagged variables for our prediction model to predict award winners. We also focus on the first time a CEO wins an award to conduct a clean identification strategy, resulting in our final sample spanning 1993 to 2015. A database with information related to CEO personal awards does not exist; therefore, we hand-collect data from Marquis Who's Who, one of the most comprehensive databases with CEOs' personal biographical details. We discover that this database sometimes contains incomplete information, that is, several CEOs' personal biographical pages include the name of an award but not the year the award was granted. In such cases, we access the official website of the award, if possible, and manually seek the award information. We also access several other databases, including Notable Names Database (NNDB.com), Reference for Business, Bloomberg.com, Wikipedia, and Google searches, to cross-check the information for each award, as well as other information on CEO characteristics (that will later be used as control variables) obtained from Marquis Who's Who. We are thus able to compile a fine-grained, comprehensive data set with (i) the name of the award, (ii) the year of the award, and (iii) the organization that granted the award.

Motivated by Malmendier and Tate (2009) and Wade et al. (2006), who study CEO media superstars who are winners of media-based CEO of the Year contests, we classify our award sample into two main categories: media-based and non-media–based awards. We define media awards as awards granted by media organizations and non-media awards as those given by non-media agencies. According to the Congress Senate Manual of the 113th Congress in 2014, containing the "Standing rules, orders, laws and resolutions affecting the business" of the U.S. Senate, the term *media organization* is defined as those "engaged in disseminating information to the general public through a newspaper, magazine, other publication, radio, television, cable television, or other medium of mass communication." Lacey's (2002, p6) book on key concepts in media studies mentions that "media businesses are organizations that produce media texts." We follow these definitions to categorize media awards as those granted by organizations that produce media products through a newspaper, magazine, other publication, radio, television, or other form of mass communication. Although our definition of media awards is quite broad, the *media* awards in our sample are mostly granted by a magazine, newspaper, or journal. We consider other organizations that do not satisfy these media criteria as non-media organizations. Awards granted by non-media organizations are categorized as non-media awards.

In our setting, we restrict our sample to awards that are granted to CEOs for their role as a company leader and we exclude awards that are awarded for personal achievements, such as an award for excellent academic performance in an MBA program. Some awards are granted to CEOs based on their services/contributions to the community. An example of such a community award is the Exemplary Community Leadership award, granted by the National Conference for Community and Justice. We exclude those awards because they are not likely granted based on their firm's past performance but, rather, on the firm's/CEO's personal contribution to the community. Since the awards granted to CEOs for their leadership roles can be predicted, at least partly, by past firm performance and CEO characteristics, this restriction allows us to estimate more accurate logit models and construct a better matched sample of award winners. More importantly, we exclude these awards because they are not necessarily related to their status as the head of a corporation.[3] Therefore, excluding these awards improves the effectiveness of our selection model, which is discussed in Section IV.A.

Using the name of each award, we access the website of the award, where possible, or search the Internet using Google to understand the nature of the award by screening for its description, selection process, and, importantly, the organization that granted the award in order to classify the award as media or non-media.[4] For example, we classify the award Best-Performing CEOs granted by Forbes Magazine as a Media award. We classify the award National Medal of Technology and Innovation as a non-media award because it is bestowed by the President of the United States and not by an agency that produces media text, such as a magazine or a newspaper.[5] To separate the effects of winning media awards and non-media awards, respectively, we exclude from our sample CEOs who are granted both media and non-media awards. The full lists of media and media awards are presented in the on-line Appendix (Tables A-10 and A11). Detailed information on our award sample is reported in Table 1.

Panels A and B of Table 1 present the number of winners by years and the total number of media and non-media awards, respectively. A CEO can be granted multiple awards across years. We focus our analyses on the first time a CEO wins an award, for two reasons. First, it provides an exogenous shock on the status of the CEO, which is the focus of our study. Second, focusing on the first time a CEO wins an award allows us to conduct a clean identification strategy on the association between CEOs' status and their firms' innovation activities. Over the period from 1993 to 2015, there were 343 media award winners and 248 non-media award winners. We start our award sample in 1993 (instead of 1992, when the ExecuComp database begins) because we use one-year-lagged variables for our prediction model to predict award winners. A CEO can be granted several awards in a given year. Therefore, we also report the number of winners by the total number of awards granted each year. Panel C shows the number of award winners by gender. We generally find more male than female winners in both the media and non-media award samples.

3.2. Measuring innovation

We measure innovation activity both as a resource input for R&D and as an innovation output. The resource input is RD, measured as R&D spending scaled by book assets. Measures of innovation outputs are based on the patent activity and impact factors of those patents. Our first measure of innovation output is based on the number of patents applied for by each firm each year. However, a simple patent count captures

[3] We find that a considerable number of CEOs in our sample were awarded social awards because of their own donations and charity services to the community.

[4] The sample of Malmendier and Tate (2009) includes awards from Ernst & Young, which we classify as *Non-media* awards because Ernst & Young is not a media organization. In untabulated results, we repeat our main analysis using a sample that includes the Ernst & Young awards as media awards and find that our results are unchanged. The results are available from the authors upon request.

[5] National Medal of Technology and Innovation is the nation's highest honor for technological achievement, bestowed by the president of the United States on CEOs of America's leading innovators. Information about this award is available at http://www.uspto.gov/learning-and-resources/ip-programs-and-awards/national-medal-technology-and-innovation-nmti. (Retrieved on May 23, 2023).

Table 1
Award information. This table presents the number of award winners by years and by the number of awards. Panel A reports award information for a sample of CEOs who received media awards. Panel B displays award information for a sample of CEOs who received non-media awards. CEOs who won both media and non-media awards are excluded. The winners are categorized into four groups: *Winners with 1 award* reports the number of CEOs who only won one award in a particular year; *Winners with 2 awards, Winners with 3 awards,* and *Winners with more than 3 awards* display the numbers of CEOs who received two, three, and more than three awards in a given year. Panel C presents award winners (media versus non-media) by gender, where media awards are defined as awards granted by media organizations and non-media awards are awards granted by non-media organizations. Data on CEOs' media and non-media awards were hand-collected from the CEOs' biographies in the Marquis Who's Who database.

Panel A: Number of winners—Media awards

Year	Winners with 1 award	Winners with 2 awards	Winners with 3 awards	Winners with more than 3 awards	Total winners	Total awards
1994	8	0	0	0	8	8
1995	4	1	0	0	5	6
1996	2	0	1	0	3	5
1997	3	0	1	0	4	6
1998	6	0	0	0	6	6
1999	9	0	0	0	9	9
2000	9	0	0	0	9	9
2001	6	2	1	0	9	13
2002	5	3	0	0	8	11
2003	8	1	0	0	9	10
2004	13	4	1	0	18	24
2005	11	3	1	2	17	28
2006	18	3	2	1	24	35
2007	17	8	2	4	31	57
2008	17	5	1	4	27	46
2009	19	8	0	3	30	49
2010	20	9	2	1	32	48
2011	13	6	3	0	22	34
2012	14	5	2	0	21	30
2013	11	6	0	1	18	28
2014	7	8	1	0	16	26
2015	12	0	1	0	13	15
Total	236	72	19	16	343	508

Panel B: Number of winners—Non-media awards

Year	Winners with 1 award	Winners with 2 awards	Winners with 3 awards	Winners with more than 3 awards	Total winners	Total awards
1993	6	1	2	0	9	14
1994	11	2	0	0	13	15
1995	8	3	0	0	11	14
1996	14	2	0	0	16	18
1997	11	2	1	0	14	18
1998	7	2	0	0	9	11
1999	10	1	0	0	11	12
2000	10	0	0	1	11	14
2001	18	2	0	0	20	22
2002	16	1	0	0	17	18
2003	16	3	0	0	19	22
2004	16	1	0	0	17	18
2005	10	0	0	0	10	10
2006	9	0	0	0	9	9
2007	18	2	0	0	20	22
2008	7	0	0	0	7	7
2009	6	0	0	0	6	6
2010	8	1	0	0	9	10
2011	4	1	0	0	5	6
2012	1	0	0	0	1	1
2013	4	3	0	0	7	10
2014	6	0	0	0	6	6
2015	1	0	0	0	1	1
Total	217	27	3	1	248	284

Panel C: Number of winners by gender

Year	Media award winners			Non-media award winners		
	Male winners	Female winners	Total winners	Male winners	Female winners	Total winners

Table 1 (*continued*)

Panel C: Number of winners by gender

Year	Media award winners			Non-media award winners		
	Male winners	Female winners	Total winners	Male winners	Female winners	Total winners
1993	4	0	4	9	0	9
1994	8	0	8	12	1	13
1995	5	0	5	10	1	11
1996	3	0	3	16	0	16
1997	4	0	4	13	1	14
1998	5	1	6	9	0	9
1999	7	2	9	11	0	11
2000	7	2	9	11	0	11
2001	7	2	9	20	0	20
2002	6	2	8	16	1	17
2003	7	2	9	18	1	19
2004	15	3	18	16	1	17
2005	13	4	17	9	1	10
2006	21	3	24	9	0	9
2007	26	5	31	18	2	20
2008	21	6	27	7	0	7
2009	22	8	30	6	0	6
2010	24	8	32	8	1	9
2011	16	6	22	4	1	5
2012	15	6	21	1	0	1
2013	10	8	18	7	0	7
2014	8	8	16	5	1	6
2015	4	9	13	1	0	1
Total	258	85	343	236	12	248

innovation success imperfectly, because patent innovations vary widely in technological and economic significance. Citations of a firm's patents can better reflect these patents' technological or economic significance. Therefore, the second measure of innovative output is based on citations per patent, which is measured by the total number of citations of the firm's filed (and eventually granted) patents, scaled by the number of patents filed (and eventually granted). The idea behind the second proxy of innovation output is that more significant and revolutionary patents will be cited more frequently, compared with more trivial patents. However, owing to the finite duration of the sample, citations suffer from truncation bias. Because citations are received for many years after a patent has been filed, patents filed in later years have less time to accumulate citations than those filed in earlier years. To address this issue, we adjust the citation count of each patent following a procedure suggested by Hall et al. (2001, 2005).

We use the patent application and citation data of Kogan et al. (2017), which are also used by Chang et al. (2019), Cohen et al. (2016, 2019) and Lu and Wang (2018).[6] Kogan et al. (2017) collect all patent data from Google Patents for the period 1926–2019.[7] As the latest year available in their database is 2019 at the time of writing this paper (May 2022), patents applied for in 2018 or 2019 may still be under review in 2019. We therefore follow Hall et al. (2001) and correct for this truncation bias be ending our innovation data in 2017 (i.e., from two year on average for a filed patent to eventually be granted). We use a patent's application year, instead of its grant year, as Griliches, Pakes, and Hall (1986) suggest that the patent's application year is closer to the actual timing of innovation and hence better captures innovation activities.

[6] The data are available at https://github.com/KPSS2017/Technological-Innovation-Resource-Allocation-and-Growth-Extended-Data. (Retrieved on May 23, 2023).

[7] The data include all patent applications filed and eventually granted during this period. Kogan et al. (2017) link patent numbers to a firm's Center for Research in Security Prices (CRSP) identifier when the filer is a public firm in the CRSP database. Following the innovation literature, we set firms with missing innovation data as having zero patents and citations.

Furthermore, we account for the truncation bias of the citations as patents granted during later years tend to have less time to attract citations (Hall et al., 2001, 2005). Following the corporate innovation literature (Hall et al., 2001, 2005), we address this bias by scaling the citations of each patent by the average citations of all patents in the same technology class each year. Due to the right-skewed distributions of patent counts and citations per patent, we use the natural logarithm of these variables. Specifically, PATENT is the natural logarithm of one plus the number of patents counts and CITATION is the natural logarithm of one plus the number of citations per patent.

3.3. Control variables

We construct and collect a number of standard firm-level variables that have been shown to affect innovative activity. Specifically, Hall and Ziedonis (2001) find that firm size is one of the key determinants of innovative activity. Firm size (SIZE) is defined as the natural logarithm of total assets. Consistent with the literature on corporate innovation (Hirshleifer et al., 2012; Li et al., 2013; Chang et al., 2015), we collect and construct other firm-level variables, including the return on assets (ROA), Tobin's Q (TOBIN_Q), leverage (LEVERAGE), and cash holdings (CASH). Specifically, TOBIN_Q is the market value of equity plus total assets minus the book value of equity, all divided by total assets, LEVERAGE is the ratio of total debt to book assets, ROA is the ratio of operating income to book assets, and CASH is measured as cash and assets readily convertible to cash, scaled by book assets. To account for possible advertising and other expenses that might increase the chance of winning an award, we include advertising expenses (AD_EXPENSE) and selling, general, and administrative expenses (SG&A).

In addition, we control for CEO characteristics. The literature documents several CEO attributes that could affect firm performance, such as gender (Huang and Kisgen, 2013), education (Bertrand and Schoar, 2003), tenure (Simsek, 2007), and age. Therefore, we include in our baseline analysis several control variables for CEO characteristics, such as the CEO's age (CEO_AGE), tenure (CEO_TENURE), and gender (FEMALE), where CEO_AGE is the age of the CEO in years, CEO_TENURE is the number of years since the current CEO became the CEO, and FEMALE is a dummy variable that equals one if the CEO is female and zero otherwise. Information on CEO gender, age, and tenure are obtained from ExecuComp.

4. Methodology

4.1. Identification strategy

Our classification of CEO awards into media and non-media categories allows us to separately examine the impact of each award group on corporate innovation activities. Our study may be subject to endogeneity issues, in that a change in firm innovation could arise from firm characteristics and not necessarily from CEO characteristics. We address this possibility using a prediction model as an identification strategy. Motivated by the work of Malmendier and Tate (2009), we compare the performance of an award winner's firm to the matched firm where the CEO had not won the award. To do so, we first construct a nearest-neighbor matching estimator. We then estimate a logit regression to identify observable firm and CEO characteristics that predict CEO awards. Finally, we compare the average ex post performance of award winners to the average among all non-winning CEOs.

Similar to the Malmendier and Tate (2009) setting, ours does not allow us to observe the exact criteria used to choose the award winners. To address this concern, we follow Malmendier and Tate (2009) and run a logit regression to predict CEO awards based on firm and CEO characteristics. Firm and CEO characteristics do not necessarily represent the full set of criteria used to select an award winner. There is a possibility that unobserved factors can be also relevant to the award selection process. In our matching procedure, we only consider observable characteristics. For all firms in our sample, we set the binary dependent variable to one if the firm's CEO won an award in the current year and zero otherwise. We then regress the award indicator on firm size (SIZE), and past stock returns ($RETURN_{t-1}$ and $RETURN_{t-2}$), as well as control for CEO age (CEO_AGE), tenure (CEO_TENURE), and gender (FEMALE). We add to our prediction model other variables that can affect firm innovation, including the past year's R&D spending scaled by total assets (RD_{t-1}), past year's number of patents ($PATENT_{t-1}$) and citations ($CITATION_{t-1}$), Tobin's Q ($TOBIN\_Q_{t-1}$), and cash holdings ($CASH_{t-1}$). All firm characteristic variables are measured the year preceding the award year. In addition, we include analyst coverage ($ANALYST\_COV_{t-1}$) as it may affect the probability of a firm winning an award. To account for possible advertising and other expenses that might increase the chance of winning an award, we include advertising expenses (AD_EXPENSE) and selling, general, and administrative expenses (SG&A). We also include year and industry dummies to control for variations in time and industry, respectively. We use two-digit SIC codes for our industry dummies. In this setting, we assume that the criteria to select winners of media and non-media awards are similar.[8]

We estimate the logit model separately for media and non-media awards. We then use the predicted values from each logit regression to construct the nearest-neighbor matched sample for the award winners. In each year, we choose, without replacement, the non-winning CEOs with the propensity scores closest to those of each actual media/non-media award winners.[9] We name these samples the predicted media winners and the predicted non-media winners, respectively.

4.2. Hypothesis testing

To test our hypotheses, we analyze the ex post firm innovation outputs of media award-winning firms and compare these with the sample of predicted media winners, using a regression framework. Specifically, we regress innovation outputs on the MEDIA dummy and several firm-level control variables and CEO characteristic control variables, as described in Section III.C. We use the following regression model:

$$INNOVATION_{i,t+k} = \alpha + \beta MEDIA_{i,t} + \sum_{j=1}^{n} \gamma_j FIRM\_CONTROL_{i,j,t} + \sum_{h=1}^{m} \delta_h CEO\_CONTROL_{i,h,t} + \varepsilon_{i,t} \quad (1)$$

where $INNOVATION_{i,t+k}$ is either the measure of innovation input (RD) or innovation output (PATENT and CITATION) of firm i in the k years after the award year. We examine the effect of winning CEO awards on firm innovation output for periods of one year ($k = 1$), two years ($k = 2$), and three years ($k = 3$) following the award year. The dummy variable MEDIA is equal to one if the CEO of the firm wins a media award in the current year and zero if the CEO is a predicted winner. The variable FIRM_CONTROL includes firm size ($SIZE_{t-1}$), stock returns over the past one and two years ($RETURN_{t-1}$ and $RETURN_{t-2}$, respectively), last year's R&D spending scaled by total assets (RD_{t-1}), the return on assets (ROA_{t-1}), Tobin's Q ($TOBIN\_Q_{t-1}$), leverage ($LEVERAGE_{t-1}$), cash holdings ($CASH_{t-1}$), advertising expenditure scaled by book assets ($AD\_EXPENSE_{t-}$

[8] Ideally, we should have included CEO media coverage in our logit model to predict media award winners similar to the approach of Blankespoor and DeHaan (2020). However, we do not have access to the data that they use to construct this measure. Nevertheless, the inclusion of non-media awards in our analysis is helpful in disentangling the effect of media coverage on the relation between CEO awards and corporate innovation.

[9] In our analysis, we use a one-to-one match as in Malmendier and Tate (2009). As a part of sensitivity analyses, we construct a one-to-three match (i.e., one award-winning firm is matched with three predicted winners) and find that our results (untabulated for brevity) are robust to the choice of matching methodology. We thank the referee for suggesting this test.

$_{1}$), selling, general, and administrative expenses (SG&A$_{t-1}$) scaled by book assets, and analyst coverage (ANALYST_COV$_{t-1}$). The variable CEO_CONTROL$_{t-1}$ includes the CEO's age in years (CEO_AGE), tenure in years (CEO_TENURE), and gender (FEMALE). We also include the industry and year dummies to account for industry- and time-invariant factors that could be associated with innovation activities (e.g., Dess et al., 1990).

To test the hypotheses for non-media awards, we run the following regression model:

$$INNOVATION_{i,t+k} = \alpha + \beta NON\_MEDIA_{i,t} + \sum_{j=1}^{n} \gamma_j FIRM\_CONTROL_{i,j,t} + \sum_{h=1}^{m} \delta_h CEO\_CONTROL_{i,h,t} + \varepsilon_{i,t} \quad (2)$$

This equation is identical to Eq. (1), except that we replace MEDIA by the dummy variable NON_MEDIA, which takes the value of one if the CEO wins a non-media award in the current year and zero if the CEO is a predicted winner.

5. Results

5.1. Univariate analysis before matching

Table 2 provides summary statistics for firm and CEO characteristics across award-winning CEOs and non-winning CEOs. Panels A and B report the results for media and non-media awards, respectively. The column $W - N$ shows the differences in the mean between award winners and non-winners.

According to Panel A of Table 2, firms led by media award-winning CEOs are on average bigger, hold more cash, have a higher Tobin's Q, are less leveraged, and are more profitable in terms of returns on assets compared to firms run by executives who did not win a media award. The media award winners tend to have a longer tenure and are more likely to be female. The latter result can be explained by the fact that there are several awards granted only to women in our media awards sample. An example of media awards specifically for women is The Most Powerful Women in American Business, from Fortune Magazine. CEOs winning media awards are more likely to have degrees from Ivy League institutions, hold a PhD, and tend to own individual patents. All these differences between winners of media awards and those that do not win media-awards are statistically significant at either the 1% or 5% levels, except INVENTOR_CEO, which is only significant at the 10% level. Regarding past returns, there is, however, no statistical difference in the stock returns of the previous one year (RETURN$_{t-1}$) and the previous two years (RETURN$_{t-2}$) between the two groups. With regard to our key variables of interest, PATENT$_{t-1}$ and CITATION$_{t-1}$ are statistically higher for award winners, whereas there is no statistical difference in R&D spending between the two groups. These results suggest that media winners are different from media non-winners in a variety of aspects.

Regarding non-media awards, the results from Panel B of Table 2 suggest that, on average, firms led by non-media winners are bigger and experience higher returns in the previous year, lower leverage and a higher Tobin's Q compared to firms run by non-media non-winning CEOs. The non-media award-winning CEOs tend to have longer tenure. Contrary to the result for media awards, the variable FEMALE is not significant for non-media awards. Non-media award-winning CEOs are significantly different from non-winners in terms of educational background, demographic factors, and experience. With regard to innovation activities, two of the measures (PATENT$_{t-1}$, and CITATION$_{t-1}$), are significantly higher at the 1% level for firms led by winning CEOs compared to their peers run by non-winning CEOs, but not RD$_{t-1}$.

Panel C presents the results for award selection criteria. To account for these criteria, we define seven dummy variables to capture award-specific characteristics, including (i) nomination to indicate if an award is self-nomination (coded as 1) or nomination by award organization (coded as 0); (ii) position to indicate if an award is for a specific position such as CEO, CFO, or other executives (1=YES; 0=NO); (iii) selection to indicate if an award is selected by jury or panel (1=YES; 0=NO); (iv) innovation criteria if an award has innovation as an explicit criterion (1=YES; 0=NO); (v) reward to indicate if an award has a trophy (1=YES; 0=NO); (vi) age restriction to indicate if there are any age restrictions (1=YES; 0=NO); and (vii) gender restriction to indicate if there is any gender restriction (1=YES; 0=NO). Panel C reports the average values for each of these selection criteria. Overall, we find that there are no differences between media and non-media awards for most of the selection criteria. The *t*-statistics for differences in means are not statistically significant for six out of seven selection criteria. Only in gender restriction we find that media awards tend to have more gender restriction compared to non-media awards. The difference is consistent with the earlier mentioned fact that there are several media awards granted only to women.

5.2. Univariate analysis after matching

Our main identification approach is to construct a nearest-neighbor matching estimator. Following Malmendier and Tate (2009), we run a logit regression to predict CEO awards based on firm and CEO characteristics. The results of logit model regressions are presented in Table 3.

Columns (1) and (2) of Table 3 report the results of the logit model to predict media and non-media awards, respectively. Consistent with the results in Table 2, CEOs of larger firms or firms with a higher past one-year return and a higher Tobin's Q are significantly more likely to win awards. Unsurprisingly, CEOs with longer tenure and female CEOs are also more likely to be award winners. These findings apply to both media and non-media awards. Regarding media awards, the past two years' return, leverage, cash holdings and CEO age are also important determinants of award winners. These four variables, however, do not significantly predict non-media award winners. These results suggest that the award panels of non-media awards are influenced by a variety of other factors that are not reflected in firm past performance as the criteria for selecting the winners.

In the next step, we use the predicted values from the logit regression to construct the nearest-neighbor matched sample for award winners. In each year, we choose, with replacement, the non-winning CEOs with the propensity scores closest to those of each actual award winner. We name this sample predicted winners. Table 2 presents the summary statistics for the predicted winners (P) side by side with the summary statistics for the actual winners (W) and the full sample of non-winners (N). We also test for differences in the firm and CEO characteristics across actual and predicted winners. Column ($W - P$) shows the results for the differences in means between award winners and predicted winners. Notably, all matching variables that are included in the first-stage estimation are statistically insignificant for both media and non-media awards.

As discussed earlier in the univariate analysis before matching, media (non-media) winners differ from non-winners in a variety of aspects. After the matching procedure is implemented, the winners and predicted winners are homogeneous in all dimensions included in the prediction model. This homogeneity confirms the quality of the match. Notably, there are no significant differences left in pre-award innovative activities between winners and predicted winners, whereas the differences between winners and non-winners are very high and significant, as discussed in Section V.A. The matching procedure generates two homogeneous groups of treated CEOs (winners) and control CEOs (predicted winners) in terms of their firm characteristics, CEO

Table 2

Summary statistics by firm. This table reports summary statistics for firm, CEO, and award selection characteristics. Panel A shows the results for media awards, while Panel B shows the results for non-media awards. The non-media awards are awards granted by non-media organizations. Data on CEOs' media and non-media awards are hand-collected from their biographies in the Marquis Who's Who database. In each panel, the winners (W) sample is based on all firms whose CEOs were winners of media awards (Panel A) or non-media awards (Panel B) in a particular year. The non-winners (N) sample consists of the remaining firms whose CEOs did not win any award in a given year. The predicted winners (P) are chosen from the non-winners (N) as those with propensity scores closest to those of each actual award winner (W). The propensity scores are constructed using predicted values from the logit model in Table 3. The matching procedure is carried out for each year t in which an award was conferred, with replacement. The variable PATENT is the logarithm of one plus the number of patents granted during the year and CITATION is the logarithm of one plus the number of citations summed across all patents applied for during the year. The numbers of patents and citations are obtained from Kogan et al. (2017) and are adjusted for truncation bias following Hall et al. (2001, 2005). The variable RD is the annual R&D expenditure scaled by the total book value of assets; $RETURN_{t-1}$ and $RETURN_{t-2}$ are the compound returns from the one and two years prior to the award year t, respectively; Size is the logarithm of the total book value of assets; TOBIN_Q is market value of equity plus total assets minus the book value of equity, all divided by total assets; LEVERAGE is the ratio of total debt to book assets; ROA is the ratio of operating income to book assets; CASH is measured as cash and assets readily convertible to cash, scaled by book assets; and ANALYST_COV is the average number of analysts following the firm over the year. Information on firm characteristics is obtained from CRSP, Compustat, and I/B/E/S. AD_EXPENSE is the ratio of advertising expenses to book assets; SG&A is the ratio of aggregated selling, general, and administrative expenses scaled by book assets; The variable CEO_AGE is the CEO age in years; CEO_TENURE is the number of years since the current CEO became CEO; and FEMALE is a dummy variable that equals one if the CEO is female and zero otherwise. Information on CEO age, tenure, and gender is obtained from ExecuComp. The variable MBA takes the value of one if the CEO has an MBA degree; IVY equals one if the CEO attended one of the Ivy League institutions, FINTECH_EDUC takes the value of one if the CEO has a technical or financial educational background; Military takes the value of one if the CEO served in the military, PhD equals one if the CEO has a PhD degree; DEPRESSION_CEO takes the value of one if the CEO was born in the period from 1920 to 1929; INVENTOR_CEO equals one if the CEO has his or her own patent; and FOREIGN_CEO equals one if the CEO was born outside the United States. Information on CEO educational and demographic backgrounds was obtained from the Marquis Who's Who. Variables with the subscript t - 1 are measured at the end of the year prior to the award year t. The column $W-N$ shows the differences in means between award winners and non-winners and $W-P$ shows the differences in means between award winners and predicted winners. Panel C reports the award selection criteria for media awards (denoted MEDIA) and non-media awards (denoted NON-MEDIA). We use seven dummy variables to capture award-specific characteristics, including (i) nomination to indicate if an award is self-nomination (=1) or nomination by award organization (=0); (ii) position to indicate if an award is for a specific position such as CEO, CFO, or other executives (1=YES; 0 =NO); (iii) selection to indicate if an award is selected by jury or panel (1=YES; 0=NO); (iv) innovation criteria to indicate if an award has innovation as an explicit criterion (1=YES; 0 = NO); (v) reward to indicate if an award has a trophy (1=YES); 0=NO); (vi) age restriction to indicate if there are any age restrictions (1=YES;0=NO); and (vii) gender restriction to indicate if there is any gender restriction (1=YES; 0=NO). The panel reports the average values for each of these selection criteria. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	Winners (W)				Non-winners (N)				Predicted winners (P)				Differences in mean	
	Obs	Mean	Med	SD	Obs	Mean	Med	SD	Obs	Mean	Med	SD	W–N	W–P
Panel A: Media awards														
Matching variables														
RD_{t-1}	343	0.034	0.003	0.058	37,398	0.042	0.003	0.090	343	0.031	0.000	0.052	−0.0080	0.002
$PATENT_{t-1}$	343	2.353	1.099	2.652	37,398	1.096	0.000	1.643	343	1.843	0.000	2.444	1.257***	0.510
$CITATION_{t-1}$	343	2.336	1.127	2.716	37,398	1.024	0.000	1.669	343	1.807	0.122	2.401	1.312***	0.529
$RETURN_{t-1}$	343	0.224	0.146	0.525	37,398	0.192	0.103	0.709	343	0.156	0.106	0.424	0.033	0.069
$RETURN_{t-2}$	343	0.243	0.016	1.261	37,398	0.174	0.034	0.985	343	0.288	0.053	1.050	0.0698	−0.044
$SIZE_{t-1}$	343	9.718	9.705	1.897	37,398	7.313	7.165	1.672	343	8.777	8.783	2.029	2.404***	0.941
$TOBIN\_Q_{t-1}$	343	1.050	1.057	0.033	37,398	1.039	1.040	0.031	343	1.046	1.047	0.029	0.011***	0.005
$LEVERAGE_{t-1}$	343	0.173	0.148	0.165	37,398	0.201	0.173	0.203	343	0.164	0.133	0.173	−0.028**	0.009
ROA_{t-1}	343	0.090	0.085	0.099	37,398	0.049	0.058	0.166	343	0.086	0.072	0.094	0.041***	0.005
$CASH_{t-1}$	343	0.192	0.138	0.174	37,398	0.159	0.089	0.179	343	0.187	0.133	0.180	0.033***	0.005
$ANALYST\_COV_{t-1}$	343	17.312	16.000	9.769	37,398	10.004	8.000	7.830	343	16.037	14.000	9.470	7.308***	1.275
AD_EXPENSE	343	0.034	0.011	0.064	37,398	0.014	0.000	0.042	343	0.028	0.004	0.068	0.020***	0.006
SG&A	343	0.268	0.194	0.230	37,398	0.249	0.195	0.228	343	0.250	0.177	0.241	0.019	0.018
CEO_AGE	343	56.367	56.000	10.211	37,398	56.811	57.000	8.334	343	56.534	56.000	8.535	−0.44328	−0.166
CEO_TENURE	343	11.930	8.000	11.533	37,398	9.670	7.000	8.593	343	11.688	9.000	9.014	2.259***	0.242
FEMALE	343	0.247	0.000	0.432	37,398	0.037	0.000	0.189	343	0.175	0.000	0.381	0.210***	0.072
Other variables														
MBA	331	0.211	0.000	0.409	13,465	0.368	0.000	0.482	331	0.243	0.000	0.482	−0.157***	−0.032
IVY	329	0.365	0.000	0.482	13,102	0.301	0.000	0.459	329	0.353	0.000	0.480	0.063**	0.012
FINTECH_EDUC	337	0.234	0.000	0.424	14,162	0.414	0.000	0.569	337	0.265	0.000	0.444	−0.179***	−0.031
MILITARY	343	0.037	0.000	0.190	13,465	0.014	0.000	0.116	343	0.011	0.000	0.103	0.023	0.026
PHD	343	0.034	0.000	0.468	13,465	0.022	0.000	0.001	343	0.030	0.000	0.385	0.011***	0.004
DEPRESSION_CEO	337	0.000	0.000	0.000	13,465	0.001	0.000	0.025	337	0.000	0.000	0.000	−0.001	0.000
INVENTOR_CEO	343	0.035	0.000	0.184	13,465	0.011	0.000	0.103	343	0.016	0.000	0.125	0.024*	0.019
FOREIGN_CEO	319	0.129	0.000	0.335	13,465	0.156	0.000	0.363	319	0.081	0.000	0.275	−0.027	0.047

Fama–French 12 industries

	Winners (W)				Non-winners (N)				Predicted winners (P)			
Consumer nondurables	10.50%	Business Equipment	24.49%	C. nond	7.28%	Bus. eq	21.98%	C. nond	5.82%	Bus. eq	21.69%
Consumer durables	0.29%	Shops	10.50%	C. dur	3.66%	Shops	14.16%	C. dur	1.59%	Shops	18.52%
Manufacturing	4.37%	Health	26.53%	Man.	14.71%	Health	11.01%	Man.	6.35%	Health	11.64%
Energy	2.92%	Other	14.87%	Energy	5.76%	Other	17.39%	Energy	4.23%	Other	27.51%
Chemicals	5.54%			Chem.	4.03%			Chem.	2.65%		

Panel B: Non-media awards														
Matching variables														
RD_{t-1}	248	0.045	0.017	0.064	22,029	0.038	0.000	0.082	248	0.043	0.000	0.081	0.004	0.002
$PATENT_{t-1}$	248	2.379	1.609	2.458	22,029	1.117	0.000	1.668	248	1.657	0.347	2.174	1.346**	0.722
$CITATION_{t-1}$	248	2.462	1.558	2.530	22,029	1.050	0.000	1.694	248	1.591	0.000	2.184	1.501**	0.871
$RETURN_{t-1}$	248	0.283	0.154	1.613	22,029	0.170	0.096	0.649	248	0.190	0.085	0.626	0.091	0.093
$RETURN_{t-2}$	248	0.161	0.035	0.709	22,029	0.152	0.035	0.731	248	0.227	0.040	1.510	−0.013	−0.066

(*continued on next page*)

Table 2 (*continued*)

Panel B: Non-media awards														
Matching variables														
$SIZE_{t-1}$	248	8.469	8.282	1.841	22,029	7.406	7.234	1.694	248	8.072	7.910	1.901	1.143***	0.398
$TOBIN\_Q_{t-1}$	248	1.049	1.052	0.032	22,029	1.039	1.040	0.031	248	1.045	1.049	0.032	0.010***	0.004
$LEVERAGE_{t-1}$	248	0.161	0.136	0.165	22,029	0.197	0.174	0.184	248	0.158	0.133	0.160	−0.040***	0.003
ROA_{t-1}	248	0.083	0.081	0.097	22,029	0.055	0.061	0.148	248	0.078	0.080	0.129	0.034***	0.005
$CASH_{t-1}$	248	0.159	0.100	0.165	22,029	0.151	0.083	0.173	248	0.178	0.097	0.198	0.000	−0.019
$ANALYST\_COV_{t-1}$	248	15.165	14.000	9.059	22,029	10.491	8.000	7.980	248	14.537	13.000	9.324	5.132***	0.628
AD_EXPENSE	248	0.023	0.000	0.057	22,029	0.015	0.000	0.042	248	0.016	0.000	0.050	0.008*	0.007
SG&A	248	0.262	0.207	0.230	22,029	0.250	0.195	0.228	248	0.238	0.183	0.210	0.012	0.024
CEO_AGE	248	57.980	57.000	8.606	22,029	57.774	58.000	8.179	248	58.077	58.000	8.426	1.182**	−0.097
CEO_TENURE	248	11.858	8.000	10.395	22,029	10.223	8.000	8.826	248	12.147	9.000	9.922	2.181***	−0.290
FEMALE	248	0.054	0.000	0.226	22,029	0.025	0.000	0.156	248	0.053	0.000	0.224	0.015	0.001
Other variables														
MBA	248	0.251	0.000	0.434	10,138	0.375	0.000	0.484	248	0.345	0.000	0.478	−0.116*	−0.094
IVY	247	0.340	0.000	0.475	10,138	0.308	0.000	0.462	247	0.202	0.000	0.404	0.038	0.138
FINTECH_EDUC	248	0.364	0.000	0.482	10,138	0.420	0.000	0.593	248	0.430	0.000	0.498	−0.046	−0.066
MILITARY	248	0.076	0.000	0.265	10,138	0.017	0.000	0.128	248	0.037	0.000	0.189	0.062***	0.039
PHD	248	0.048	0.000	0.050	10,138	0.022	0.000	0.042	248	0.019	0.000	0.040	0.026	0.028
DEPRESSION_CEO	248	0.000	0.000	0.000	10,138	0.000	0.000	0.000	248	0.000	0.000	0.000	−0.001	0.000
INVENTOR_CEO	248	0.025	0.000	0.157	10,138	0.015	0.000	0.120	248	0.016	0.000	0.125	0.014	0.009
FOREIGN_CEO	214	0.168	0.000	0.375	10,138	0.155	0.000	0.362	214	0.104	0.000	0.308	0.014	0.064

Fama–French 12 industries

Winners (W)				Non-winners (N)				Predicted winners (P)			
Consumer nondurables	6.45%	Business Equipment	35.48%	C. nond	7.32%	Bus. eq	21.94%	C. nond	6.50%	Bus. eq	24.50%
Consumer durables	2.02%	Shops	17.74%	C. dur	3.65%	Shops	14.25%	C. dur	3.00%	Shops	13.50%
Manufacturing	12.90%	Health	5.65%	Man.	14.64%	Health	10.98%	Man.	12.00%	Health	10.00%
Energy	2.82%	Other	9.27%	Energy	5.76%	Other	17.43%	Energy	6.00%	Other	20.00%
Chemicals	7.66%			Chem.	4.03%			Chem.	4.50%		

Panel C. Award selection criteria

No.	Selection Criteria	MEDIA	NON-MEDIA	Difference (1 - 2)	
		(1)	(2)	mean	t-stats.
1	Nomination	0.453	0.520	−0.067	(−1.12)
2	Specific position	0.054	0.059	−0.005	(−0.15)
3	Selection	0.460	0.520	−0.060	(−1.01)
4	Innovation criteria	0.025	0.032	−0.007	(−0.36)
5	Reward	0.224	0.224	0.000	(−0.64)
6	Age restriction	0.019	0.000	0.019	(1.54)
7	Gender restriction	0.099	0.000	0.099***	(3.70)

educational and demographic backgrounds. Homogeneity is a key factor that helps minimize endogeneity issues in our regression analysis in the next steps.

Fig. 1 and Fig. 2 presents the average of innovation outputs of award winners and predicted winners from the three years before (year −3) to three years after the award year (year +3).

We observe no clear pattern in the trends before and after the award for CEOs receiving media awards in Fig. 1. Fig. 2 reveals a difference in trends after the award for non-media award CEOs. Fig. 2 confirms a parallel trend from year t-3 to t-2 for both patents and citations, suggesting comparability between non-media winners and predicted winners before the award event. There is a slight deviation between the non-media award winners and predicted winners in year t-1. This deviation can possibly be attributed to the effects of pre-award nominations that generally take place sometime before the actual awards. However, most of the differences between winners and non-winners happen in the post-award period.

5.3. Regression analysis

In our regression framework, the dependent variables are innovation activities, measured by PATENT, CITATION, and RD. Our key variable of interest is MEDIA (NON_MEDIA), which is equal to one if the CEO is a winner of a media (non-media) award competition and zero if the CEO is a predicted winner of a media (non-media) award. Other explanatory variables include a set of firm characteristics and CEO characteristics. In addition, we include the award selection criteria specified in Panel C of Table 2. Table 4 presents the regression results after the matching.

Panel A of Table 4 presents the results for media awards. In Column (1), the coefficient for MEDIA is not statistically significant, indicating that MEDIA award winners and predicted winners obtain a similar number of patents and citations. The results are consistent for periods of one, two, and three years after the award year. Columns (3), (6), and (9) consistently suggest no significant difference in innovation input (measured by R&D spending) between media winners and predicted winners.[10]

Panel B of Table 4 reports the results for non-media awards. Both innovation outputs PATENT and CITATION are higher for the award winners (but not statistically significantly so) in the year immediately after the award year. The gap between winners and non-winners increases and becomes statistically significant at either the 5% level or the 1% level in the second year and the third year after the award year, suggesting that it takes time to translate the positive effects of CEOs winning non-media awards into innovation outputs. The coefficients for award dummy in the regression for innovation input, RD_{t+1}, are not significant. Recalling that, in Table 2, the R&D spending of non-media winners and of predicted winners does not differ significantly, we find the regression results suggest that firms led by non-media award winners generate statistically greater corporate innovation outputs with relatively similar innovation inputs, compared to firms run by predicted winners, implying greater innovation effectiveness. Regarding economic significance, non-media-winning CEO firms generate, on average,

[10] One possible explanation is that the positive effect and negative effect of winning media awards cancel each other out, leading to the insignificant effect of winning media awards on corporate innovation.

Table 3
Logit models to predict awards. Columns (1) and (2) report the results for the logit models that predict media and non-media award winners, respectively. The binary dependent variable equals one if the firm's CEO won an award in the current year and zero otherwise. The variables $RETURN_{t-1}$ and $RETURN_{t-2}$ are the compound returns from the one and two years prior to the award year, respectively; SIZE is the logarithm of the total book value of assets; TOBIN_Q is market value of equity plus total assets minus the book value of equity, all divided by total assets; RD is the annual R&D expenditure scaled by the total book value of assets; PATENT is the logarithm of one plus the number of patents granted during the year; CITATION is the logarithm of one plus the number of citations summed across all patents applied for during the year; LEVERAGE is the ratio of total debt to book assets; ROA is the ratio of operating income to book assets; CASH is measured as cash and assets readily convertible to cash, scaled by book assets; AD_EXPENSE is the ratio of advertising expense to book assets; SG&A is the ratio of aggregated selling, general, and administrative expenses scaled by book assets; ANALYST_COV is the average number of analysts following the firm over the year; CEO_AGE is the CEO age in years; CEO_TENURE is the number of years since the current CEO became CEO; and FEMALE is a dummy variable that equals one if the CEO is female and zero otherwise. Variables with the subscript t - 1 are measured at the end of the year prior to the award year t. Industry dummies is the dummy for the two-digit Standard Industrial Classification (SIC) industry code. Industry dummies and year dummies are not reported here for brevity. The *z*-statistics are reported in parentheses. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1) **Media awards**	(2) **Non-media awards**
$RETURN_{t-1}$	0.169***	0.183***
	(2.95)	(4.25)
$RETURN_{t-2}$	0.113**	0.053
	(1.99)	(0.91)
$SIZE_{t-1}$	1.285***	0.275**
	(9.86)	(2.56)
$TOBIN\_Q_{t-1}$	27.356***	7.940*
	(3.40)	(1.92)
RD_{t-1}	0.177	−2.657
	(0.10)	(−1.52)
$PATENT_{t-1}$	−0.116	0.188
	(−0.73)	(1.37)
$CITATION_{t-1}$	−0.072	0.011
	(−0.55)	(0.12)
$LEVERAGE_{t-1}$	−1.900*	−0.256
	(−1.87)	(−0.35)
ROA_{t-1}	−0.027	1.195*
	(−0.05)	(1.81)
$CASH_{t-1}$	2.441***	0.106
	(3.80)	(0.16)
$ANALYST\_COV_{t-1}$	−0.256	0.202
	(−1.02)	(1.22)
AD_EXPENSE	5.412***	2.275*
	(2.66)	(1.91)
SG&A	−0.561	0.649
	(−0.50)	(1.07)
CEO_AGE	−4.059**	0.849
	(−2.27)	(0.81)
CEO_TENURE	0.698***	0.306**
	(3.83)	(2.53)
FEMALE	3.987***	2.024***
	(9.46)	(5.32)
Year dummies	Yes	Yes
Industry dummies	Yes	Yes
No. of obs.	16,578	17,053
Pseudo-R^2	0.429	0.332

38.8% more patents and 71.2% more citations compared to predicted winners in the two years after the award.[11]

Overall, award-winning CEO firms maintain their superior performance regarding innovation outputs for at least three years after the award announcement. This persistent effect can be explained by the fact that innovation is a long-term activity. Therefore, the effect of winning a non-media award can be gradually transferred to innovation success.

Regarding control variables, we find that firm size and past R&D spending are positively and significantly associated with firm innovation output. These findings hold for both media and non-media award samples and are robust for periods of one, two to three years after the award year. These results are consistent with those of prior studies (e.g., Hirshleifer et al., 2012; Li et al., 2013; Chang et al., 2015) that document that firm size and past R&D spending are two of the main factors that drive innovation activities.

In addition to the baseline models in Table 4, we conduct a number of additional analyses. *First*, we acknowledge that there is a possibility that more innovative firms have higher ex ante media coverage and hence, their CEOs are more likely to win media awards and other awards, potentially leading to biased conclusion from comparing these two groups. To address a concern that firms with media award-winning CEOs and non-media award-winning CEOs may have different ex-ante media coverage, which can affect their probability of winning the awards, we include media coverage as an additional explanatory variable in our logit models as in Table 3 and construct predicted winners sample based on the propensity scores closest to those of each actual award winner. We report the results for these tests in Table A-1 in the Internet Appendix A and find that our results are highly consistent with our previous findings even though there is a significant drop in the number of observations due to the availability of media coverage data.

Second, we account for CEOs' general media recognition that might drive our documented findings. Given there is no consensus on the best measure of CEO media recognition, we employ three different measures to capture the multi-dimensional effects of general media recognition. First, we consider CEOs' network to capture their media attention. According to the social science literature (e.g., Hanneman and Riddle, 2005; Jackson, 2010), an individual's social network carries two important benefits: i) a powerful social network is associated with better information access; and ii) the strong network position can allow more opportunities and reduce constraints. Following prior literature (e.g., El-Khatib et al., 2015; Egginton and McCumber, 2019), our first measure, CEO NETWORK, is a measure of the network centrality of a CEO with data from the BoardEx database, following the approach of Egginton and McCumber (2019). BoardEx database covers information about the number of direction connections that an individual's network has. CEO NETWORK, provides a comprehensive measure of network positions by considering all four dimensions of network centrality for every executive in the network, including degree, eigenvector, betweenness, and closeness centrality (Egginton and McCumber, 2019).[12]

Our second measure is motivated by growing evidence that CEO's adoption of social media may improve the information environment and attract more attention from investors and other market participants (e.g., Chen et al., 2014; Heavey et al., 2020; Zhang, and Mooney Murphy, 2021). We construct a variable (TOP SOCIAL MEDIA CEO) indicating whether a CEO belongs to the Top 100 CEOs on social media based on the ranking of Hootsuite, a social media management system designed for business brand and management.[13]

Third, a paper by Di Giuli and Laux (2022) suggests that firms with a media-linked director tend to attract more media attention. Therefore,

[11] Since these dependent variables for innovation activities are in natural logarithmic form, we take the exponential of the coefficients on awards to derive their impact on the dependent raw values. For example, the coefficient of 0.328 for NON_MEDIA means an 38.8% ($= e^{0.328} - 1$) increase in the patents.

[12] We thank Jared Egginton and William McCumber for generously sharing the network data.

[13] The rankings combined both quantitative and qualitative factors to determine the CEOs who are really making an impact. The rankings are available at: https://www.linkedin.com/pulse/top-100-ceos-social-media-steve-tappin/ (retrieved on May 23, 2023)

Fig. 1. Innovation outputs of media award winners and predicted winners. The figures present innovation outputs, measured by the number of patents and citations, from three years before to three years after the award year. Predicted winners are chosen from the non-winners as those with the propensity scores closest to those of each actual award winner. The orange line presents the average innovation outputs of media winners. The blue line presents the average innovation outputs of predicted winners. Year *t*-3 compared to the award year is normalized to zero.

we follow Giuli and Laux (2022)'s approach to construct this variable from the BoardEx and CRSP databases. Specifically, we first identify media firms using the standard industry code (SIC) in the CRSP database that belongs to ratio and television broadcasting stations, newspapers, periodicals, and firms that are listed in the cable network industry and produce news and information. We then obtain the list of directors of every media firm from BoardEX database. Our third and final measure, MEDIA_DIRECTOR, is an indicator indicating if a firm has a media-linked director.

Combined together, we employ three measures that capture the multi-dimensional effects of general media recognition of a CEO. To account for the potential impacts of CEO media recognition, we re-estimated our baseline results in Table 4 after controlling for three measures of general media recognition. We report the results for these tests in Table 5.

We find that our main findings are robust after accounting for CEO general media recognition. In particular the significance levels for the MEDIA and NON-MEDIA AWARD variables are virtually the same between the two tables.

Third, we examine the possibility that the differences in innovation outputs are not because of media versus non-media awards, but rather industry-specific vs. general CEO recognition. To mitigate the possibility that our findings can be entirely driven by industry-specific recognition, we have re-estimated our baseline models after excluding industry-specific awards. We find that our results (untabulated for brevity but available upon request) are robust after accounting for industry-specific recognition.

Fourth, to assess the potential effects of prior trends, we construct panel data based on a seven-year window before and after the award date [−3, +3]. We also employ firm fixed effects with trend indicators. We include several trend indicators. Specifically, in Panel A, $NONMEDIA^{-3}$, $NONMEDIA^{-2}$, $NONMEDIA^{-1}$, $NONMEDIA^{0}$, $NONMEDIA^{+1}$, $NONMEDIA^{+2}$, and $NONMEDIA^{+3}$ are variables that indicate three years before, two years before, one year before, the current year, one year after, two years after, and three years after the year that CEO won a non-media award, respectively. The same principle applies to the variables $MEDIA^{-3}$, $MEDIA^{-2}$, $MEDIA^{-1}$, $MEDIA^{0}$, $MEDIA^{+1}$, $MEDIA^{+2}$, and $MEDIA^{+3}$. The results (untabulated for brevity) suggest that coefficients of $NONMEDIA^{-3}$, $NONMEDIA^{-2}$, *and* $NONMEDIA^{-1}$ are statistically insignificant, while the coefficients of $NONMEDIA^{+2}$ and $NONMEDIA^{+3}$

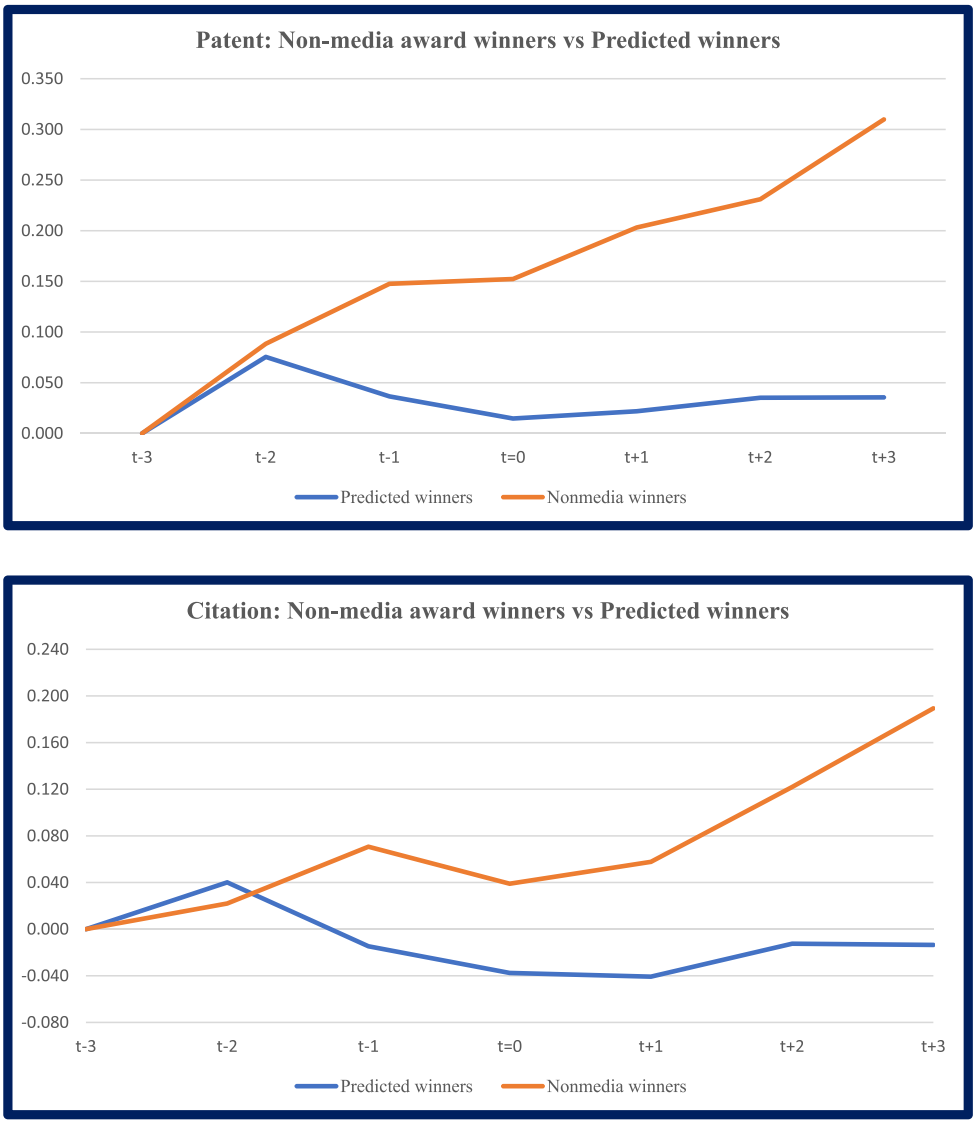

Fig. 2. Innovation outputs of non-media award winners and predicted winners. The figures present innovation outputs, measured by the number of patents and citations, from three years before to three years after the award year. Predicted winners are chosen from the non-winners as those with the propensity scores closest to those of each actual award winner. The orange line presents the average innovation outputs of non-media winners. The blue line presents the average innovation outputs of predicted winners. Year t-3 compared to the award year is normalized to zero.

are positive and statistically significant. The results indicate that non-media award-winning firms only begin to improve their innovation outcomes two and three years after the award year, but not before. Thus, the parallel trends assumption is satisfied and the documented effect of nonmedia award-winning on innovation is causal. In addition, we find that none of the trend indicators is statistically significant, suggesting no significant difference in innovation outcomes between media award winners and their control firms.

Fifth and finally, we conduct several other robustness checks. Specifically, we consider alternative samples, alternative explanations, and model estimations. We report the results for these tests in Table A-6 in the Online Appendix. Overall, our baseline models in Table 4 and various additional analyses in the Online Appendix suggest that our results are robust.

5.4. Potential benefits from award-winning

We consider the potential benefits from winning awards (both media and non-media awards). Prior studies suggest that growth opportunities can contribute to innovation performance (e.g., Pisano, 2015; Acemoglu et al., 2018; McKinseyandCompany, 2020). Firms led by award-winners could be associated with more growth opportunities, thanks to the change in their status following an award, which contributes to more stable operating cash flows and a reduction in the variability of future outcomes. As innovation involves a long process characterized by large uncertainty and long-term commitments (Holmstrom, 1989), more growth opportunities have the potential to contribute to promoting innovative activities. We follow prior studies (e.g., Lin et al., 2021; Nguyen et al., 2021) and use Tobin's Q to capture a firm's growth opportunities. We also include the lagged variable of the dependent variable to account for potential trend effects. We report the results for these tests in Table 6.

We find that the coefficients for both media and non-media awards are positive and significantly different at respectively the 1% and the 5% level. These results mean that winners of both types of awards are associated with more growth opportunities following their awards.

6. Possible channels

In this section, we discuss possible underlying mechanisms through

Table 4

Impact of winning CEO awards on innovation. This table reports the regression results for the sample that includes winners and predicted winners. Predicted winners (P) are chosen from the non-winners (N) as those with the propensity scores closest to those of each actual award winner (W). Panels A and B report the results for media and non-media awards, respectively. Columns (1) to (9) report the regression estimates for each ordinary least squares (OLS) regression with different dependent variables. The dependent variables are PATENT, CITATION, and RD, where PATENT is the logarithm of one plus the number of patents applied for during the year and CITATION is the logarithm of one plus the number of citations per patent. The numbers of patents and citations are obtained from Kogan et al. (2017) and are adjusted for truncation bias following Hall et al. (2001, 2005). The variable RD is the annual R&D expenditure scaled by the total book value of assets, t is the award year, and $t+1$, $t+2$, and $t+3$ represent one, two, and three years after the award year t, respectively. The independent variables include MEDIA (a dummy variable equal to one if the CEO won at least one media award in year t and zero otherwise); NON_MEDIA (a dummy variable equal to one if the CEO won at least one non-media award in year t and zero otherwise); $RETURN_{t-1}$ and $RETURN_{t-2}$ (the compound returns from one and two years prior to the award year t, respectively); SIZE (the logarithm of the total book value of assets); TOBIN_Q (market value of equity plus total assets minus the book value of equity, all divided by total assets); RD_{t-1} (the previous year's annual R&D expenditure scaled by the total book value of assets); LEVERAGE (the ratio of total debt to book assets); ROA (the ratio of operating income to book assets); CASH (measured as cash and assets readily convertible to cash, scaled by book assets); ANALYST_COV is the average number of analysts following the firm over the year; AD_EXPENSE is the ratio of advertising expense to book assets; SG&A is the ratio of aggregated selling, general, and administrative expenses scaled by book assets; CEO_AGE (the age of CEOs in years); CEO_TENURE (the number of years since the current CEO became CEO), and FEMALE (a dummy variable that equals one if the CEO is female and zero otherwise); and Industry dummies is the dummy for the two-digit SIC industry code. We also include the lagged values of dependent variables. To capture award-specific characteristics, we include seven dummy variables, including (i) nomination to indicate if an award is self-nomination (=1) or nomination by award organization (=0); (ii) position to indicate if an award is for a specific position such as CEO, CFO, or other executives (1=YES; 0 =NO); (iii) selection to indicate if an award is selected by jury or panel (1=YES; 0=NO); (iv) innovation criteria to indicate if an award has innovation as an explicit criterion (1=YES; 0 = NO); (v) reward to indicate if an award has a trophy (1=YES); 0=NO); (vi) age restriction to indicate if there are any age restrictions (1=YES;0=NO); and (vii) gender restriction to indicate if there is any gender restriction (1=YES; 0=NO). Industry dummies, year dummies, award indicators, and lagged values of dependent variables are not reported for brevity. The *t*-statistics are reported in parentheses. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Media awards

	1 year after the award year			2 years after the award year			3 years after the award year		
	(1) $PATENT_{t+1}$	(2) $CITATION_{t+1}$	(3) RD_{t+1}	(4) $PATENT_{t+2}$	(5) $CITATION_{t+2}$	(6) RD_{t+2}	(7) $PATENT_{t+3}$	(8) $CITATION_{t+3}$	(9) RD_{t+3}
MEDIA	−0.002	−0.130	−0.001	0.007	−0.113	−0.001	0.073	−0.018	0.000
	(−0.03)	(−1.37)	(−0.48)	(0.13)	(−1.29)	(−1.15)	(1.26)	(−0.19)	(0.29)
$RETURN_{t-1}$	0.017	−0.144	0.005	−0.000	0.027	−0.003	0.052	0.080	−0.001
	(0.34)	(−1.42)	(1.50)	(−0.00)	(0.30)	(−0.72)	(0.83)	(1.01)	(−0.73)
$RETURN_{t-2}$	0.031	0.016	0.000	−0.008	0.006	0.001	0.029	−0.034*	0.000
	(1.50)	(0.65)	(0.66)	(−0.59)	(0.26)	(1.31)	(0.90)	(−1.68)	(1.03)
$SIZE_{t-1}$	0.029	0.068	−0.001	0.028	−0.002	0.002***	0.021	0.134**	−0.000
	(1.22)	(1.49)	(−0.81)	(0.94)	(−0.05)	(3.93)	(0.70)	(2.12)	(−0.36)
$TOBIN\_Q_{t-1}$	0.797	2.909	−0.146**	1.552	2.139	0.034	2.533*	0.022	−0.032
	(0.72)	(1.44)	(−2.23)	(1.37)	(1.07)	(1.07)	(1.84)	(0.01)	(−0.82)
RD_{t-1}	0.645	0.672	0.007	−0.914	0.096	0.065	−0.176	0.106	0.136
	(1.03)	(0.69)	(0.10)	(−1.29)	(0.09)	(1.20)	(−0.23)	(0.12)	(1.37)
$LEVERAGE_{t-1}$	0.200	−0.429	−0.002	−0.222	−0.274	−0.014**	−0.305*	−0.212	−0.002
	(1.07)	(−1.35)	(−0.39)	(−1.05)	(−0.89)	(−2.57)	(−1.77)	(−0.84)	(−0.58)
ROA_{t-1}	0.506**	0.026	0.025	−0.053	0.319	−0.022**	0.336	−0.331	−0.027**
	(2.18)	(0.07)	(0.90)	(−0.20)	(0.91)	(−2.28)	(0.97)	(−0.73)	(−2.48)
$CASH_{t-1}$	0.015	−0.205	0.010	0.342	0.216	0.008	0.298	0.447	0.017**
	(0.06)	(−0.65)	(0.95)	(1.41)	(0.64)	(1.05)	(1.16)	(0.93)	(2.15)
$ANALYST\_COV_{t-1}$	0.008***	0.001	0.000	0.001	0.012**	−0.000*	0.010**	0.009*	0.000
	(2.75)	(0.11)	(1.00)	(0.30)	(2.29)	(−1.87)	(2.40)	(1.78)	(0.53)
$AD\_EXPENSE_{t-1}$	0.207	0.734	0.009	−0.072	−1.703***	0.002	0.061	−0.844	−0.001
	(0.50)	(1.16)	(0.59)	(−0.20)	(−2.90)	(0.12)	(0.12)	(−1.31)	(−0.08)
$SG\&A_{t-1}$	0.481***	−0.027	0.002	0.132	0.315	0.003	0.422**	0.703***	0.002
	(2.85)	(−0.10)	(0.52)	(0.89)	(1.22)	(0.78)	(2.51)	(2.62)	(0.35)
CEO_AGE	−0.229	−0.541	0.009	−0.311	−0.092	−0.012*	−0.277	−0.414	−0.000
	(−0.78)	(−0.82)	(0.87)	(−1.06)	(−0.13)	(−1.84)	(−0.82)	(−0.66)	(−0.03)
CEO_TENURE	−0.033	−0.039	0.001	−0.001	−0.019	0.001	−0.072*	0.000	−0.001
	(−0.85)	(−0.79)	(0.66)	(−0.03)	(−0.36)	(1.34)	(−1.83)	(0.01)	(−0.74)
FEMALE	−0.108	−0.088	0.004	−0.107	−0.371*	0.003	−0.097	−0.102	0.002
	(−1.22)	(−0.58)	(1.33)	(−1.00)	(−1.86)	(1.16)	(−1.09)	(−0.72)	(0.62)
Lagged value of dependent variable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Award characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	588	588	588	583	583	583	576	576	576
Adjusted R^2	0.971	0.940	0.921	0.972	0.931	0.944	0.967	0.930	0.938

Panel B: Non-media awards

	1 year after the award year			2 years after the award year			3 years after the award year		
	(1) $PATENT_{t+1}$	(2) $CITATION_{t+1}$	(3) RD_{t+1}	(4) $PATENT_{t+2}$	(5) $CITATION_{t+2}$	(6) RD_{t+2}	(7) $PATENT_{t+3}$	(8) $CITATION_{t+3}$	(9) RD_{t+3}
NON_MEDIA	0.101	0.049	−0.003	0.328**	0.538***	0.000	0.393**	0.651***	−0.003
	(1.43)	(0.50)	(−0.94)	(2.16)	(3.53)	(0.09)	(2.54)	(4.04)	(−0.81)
$RETURN_{t-1}$	−0.002	−0.018	0.000	0.053	0.052	−0.003***	0.076	0.068	−0.002
	(−0.08)	(−0.53)	(0.09)	(1.05)	(1.02)	(−2.89)	(1.49)	(1.26)	(−1.44)
$RETURN_{t-2}$	0.036	0.073*	−0.002	0.139**	0.108*	0.004***	0.084	0.092	0.003**

(*continued on next page*)

Table 4 (*continued*)

Panel B: Non-media awards	1 year after the award year			2 years after the award year			3 years after the award year		
	(1) $PATENT_{t+1}$	(2) $CITATION_{t+1}$	(3) RD_{t+1}	(4) $PATENT_{t+2}$	(5) $CITATION_{t+2}$	(6) RD_{t+2}	(7) $PATENT_{t+3}$	(8) $CITATION_{t+3}$	(9) RD_{t+3}
	(1.24)	(1.84)	(−1.61)	(2.27)	(1.74)	(3.00)	(1.34)	(1.41)	(2.34)
$SIZE_{t-1}$	0.065*	0.084*	0.000	0.719***	0.518***	0.001	0.652***	0.494***	0.002
	(1.70)	(1.69)	(0.03)	(9.68)	(6.92)	(0.54)	(8.69)	(6.28)	(1.53)
$TOBIN\_Q_{t-1}$	3.546**	7.600***	−0.010	5.970*	2.703	−0.011	4.335	4.056	−0.043
	(2.26)	(3.54)	(−0.13)	(1.75)	(0.78)	(−0.15)	(1.26)	(1.12)	(−0.55)
RD_{t-1}	1.664***	1.382	−0.113*	4.850***	6.009***	0.218***	5.997***	6.266***	0.276***
	(2.61)	(1.56)	(−1.91)	(3.61)	(4.43)	(3.91)	(4.37)	(4.36)	(4.64)
$LEVERAGE_{t-1}$	−0.555**	−0.503	−0.000	−1.969***	−1.724***	−0.000	−1.953***	−1.859***	−0.002
	(−2.13)	(−1.40)	(−0.01)	(−3.52)	(−3.05)	(−0.02)	(−3.46)	(−3.15)	(−0.14)
ROA_{t-1}	0.372	−0.160	0.037*	0.557	0.831	0.026	0.081	0.378	0.065***
	(0.93)	(−0.29)	(1.86)	(0.65)	(0.97)	(1.41)	(0.09)	(0.42)	(3.25)
$CASH_{t-1}$	0.151	0.083	−0.014	−0.139	−0.331	0.030***	−0.118	−0.230	0.024**
	(0.63)	(0.25)	(−1.19)	(−0.27)	(−0.64)	(2.60)	(−0.22)	(−0.42)	(2.03)
$ANALYST\_COV_{t-1}$	0.007	0.009	0.000	0.008	0.051***	0.000	0.014	0.046***	0.000
	(1.43)	(1.27)	(0.56)	(0.68)	(4.61)	(1.32)	(1.28)	(3.95)	(0.66)
$AD\_EXPENSE_{t-1}$	−0.857	−0.455	−0.022	−2.636*	−2.664*	−0.017	−3.699**	−3.973**	−0.026
	(−1.20)	(−0.46)	(−0.61)	(−1.73)	(−1.74)	(−0.51)	(−2.30)	(−2.36)	(−0.70)
$SG\&A_{t-1}$	−0.089	0.114	0.019*	−0.098	0.376	0.011	−0.118	0.421	0.020*
	(−0.40)	(0.38)	(1.75)	(−0.21)	(0.79)	(1.01)	(−0.24)	(0.81)	(1.76)
CEO_AGE	0.059	0.131	−0.006	−1.776**	−1.437*	0.006	−1.699**	−1.648**	−0.005
	(0.16)	(0.26)	(−0.31)	(−2.28)	(−1.83)	(0.34)	(−2.14)	(−1.99)	(−0.27)
CEO_TENURE	0.009	0.053	−0.003	−0.031	−0.119	−0.001	−0.089	−0.125	−0.004
	(0.21)	(0.87)	(−1.34)	(−0.33)	(−1.25)	(−0.44)	(−0.93)	(−1.25)	(−1.64)
FEMALE	0.023	−0.102	0.004	−0.880**	−0.774**	0.020**	−0.859**	−0.715*	0.026***
	(0.13)	(−0.44)	(1.43)	(−2.36)	(−2.06)	(2.42)	(−2.20)	(−1.75)	(2.97)
Lagged value of dependent variable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Award characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	452	452	452	442	442	442	437	437	437
Adjusted R^2	0.949	0.907	0.806	0.782	0.784	0.818	0.782	0.764	0.786

which winning CEO awards can affect corporate innovative activities. The first channel relates to market attention following CEO awards. The second channel relates to analyst-induced pressure. The third and fourth channels relate to employee treatment and the ability of the company to attract inventors.

6.1. *Difference in market attention between media and non-media awards*

Why are media and non-media awards different? A plausible distinction is a potential difference(s) of these two awards on CEO distraction. We argue in the previous sections that compared to non-media award-winning CEOs, media-award winning CEOs are more likely to become the center of media attention which accelerates their distraction. In this section, we examine the potential effects of media and non-media awards on CEO distraction. Following Da et al. (2011, 2015), we utilize a direct measure of market attention using search frequency in Google, named Search Volume Index (SVI).[14] SVI provides a direct measure of market attention and captures it in a timelier fashion compared to other measures of investor attention (Da et al., 2011). Our procedure is as follows. First, we manually collect the date when each award is granted by searching the official website of the award, executive profiles and company websites, or other databases, including NNDB.com, Reference for Business, Bloomberg.com, Wikipedia, and Google searches. Second, we search and download the weekly SVI for each award-winning CEOs using their names and companies. Our key variable of interest, abnormal search volume index (*ASVI*), is defined as follows:

$$ASVI_t = log(1 + SVI_t) - log[1 + Median\,(SVI_{t-1}, \ldots, SVI_{t-8})] \quad (3)$$

where log (SVI_t) is the logarithm of SVI during the week, and log (SVI) is the logarithm of the median value of SVI during the prior 8 weeks. Following Da et al. (2011), we use the median over a longer time window to capture the normal level of median attention that is less likely driven by recent jumps. The higher the ASVI, the higher market demand for information on CEOs, the higher award-induced distraction. We are interested in both short-term (from Week 1 to Week 4) and long-term (from Week 12 to Week 24) windows following the award week (Week 0). We then consider the potential effects of media and non-media awards on CEO distraction and report results in Table 7.

According to Table 7, there is a significant positive ASVI during the first four weeks following the media-award week. The surge in CEO's media visibility, as induced by the media awards, often leads to higher CEO distraction as documented by Wade et al. (2006) and Malmendier and Tate (2009). With regard to non-media award winners, we find a significant positive ASVI only in the first week following the award week. ASVI then becomes insignificantly different from zero from the second week. We also find that the ASVI is significantly higher among media-award winners than no-media award winners during the first four weeks following the award date, which confirms the significance and persistence of media awards on the CEO distraction.

6.2. *Impact of winning CEO awards on analyst coverage*

Malmendier and Tate (2009) find that CEO awards are more likely to broader CEO media visibility and hence, attract a larger coverage of financial analysts. As mentioned in the hypotheses section, increased analyst coverage is likely to lead to fewer innovation outputs, because of short-term pressure on managers.

[14] Google Trends provides data on search term frequency that goes back to January 2004.

Table 5

Control for media recognition. This table reports the regression results for the sample that includes non-media winners and predicted winners. Predicted winners (P) are chosen from the non-winners (N) as those with the propensity scores closest to those of each actual award winner (W). Panels A and B report the results when $PATENT_{t+1}$ or $CITATION_{t+1}$ is the dependent variable, respectively, where PATENT is the logarithm of one plus the number of patents applied for during the year and CITATION is the logarithm of one plus the number of citations per patent. The numbers of patents and citations are obtained from Kogan et al. (2017) and are adjusted for truncation bias following Hall et al. (2001, 2005). The year t is the award year and year $t+1$ represents the year after the award year t. The independent variables include MEDIA (a dummy variable equal to one if the CEO won at least one media award in year t and zero otherwise); NON_MEDIA (a dummy variable equal to one if the CEO won at least one non-media award in year t and zero otherwise). CEO NETWORK is a measure of the network centrality of a CEO with data from BoardEx database, following Egginton and McCumber (2019). Top Social Media CEO is a variable indicating if a CEO belongs to the Top 100 CEOs on social media based on the ranking of Hootsuite. Media Director is a variable indicating if a firm has a media-linked director. We follow Di Giuli and Laux (2022)'s approach to define media-linked directors. The industry dummies, year dummies, and coefficients on baseline control variables are not reported here for brevity. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Media awards

	1 year after the award year			2 years after the award year			3 years after the award year		
	(1) $PATENT_{t+1}$	(2) $CITATION_{t+1}$	(3) RD_{t+1}	(4) $PATENT_{t+2}$	(5) $CITATION_{t+2}$	(6) RD_{t+2}	(7) $PATENT_{t+3}$	(8) $CITATION_{t+3}$	(9) RD_{t+3}
MEDIA	0.037	−0.029	0.007	0.070	0.022	−0.003	−0.029	−0.056	−0.002
	(0.56)	(−0.36)	(1.14)	(0.99)	(0.26)	(−1.07)	(−0.41)	(−0.38)	(−0.86)
CEO NETWORK	0.099	0.059	0.006	−0.060	0.244***	−0.009**	−0.105	−0.158	0.000
	(1.33)	(0.56)	(0.93)	(−0.83)	(2.95)	(−2.47)	(−1.42)	(−1.41)	(0.11)
TOP SOCIAL MEDIA CEO	0.223	0.185	−0.018	0.211	0.289*	0.005	0.220	0.134	0.016**
	(1.46)	(0.75)	(−0.78)	(1.29)	(1.65)	(0.74)	(1.48)	(0.67)	(2.48)
MEDIA DIRECTOR	0.088	0.033	−0.011**	0.044	0.227***	−0.002	0.088	0.089	−0.004*
	(1.43)	(0.48)	(−2.12)	(0.62)	(2.75)	(−1.07)	(1.04)	(0.76)	(−1.67)
All controls as baseline	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Award characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	429	429	429	424	424	424	419	419	419
Adjusted R-squared	0.968	0.949	0.919	0.972	0.958	0.872	0.973	0.925	0.883

Panel B: Non-media awards

	1 year after the award year			2 years after the award year			3 years after the award year		
	(1) $PATENT_{t+1}$	(2) $CITATION_{t+1}$	(3) RD_{t+1}	(4) $PATENT_{t+2}$	(5) $CITATION_{t+2}$	(6) RD_{t+2}	(7) $PATENT_{t+3}$	(8) $CITATION_{t+3}$	(9) RD_{t+3}
NON_MEDIA	0.118	0.100	0.004	0.542**	0.564**	0.003	0.567**	0.668***	0.006
	(1.00)	(0.74)	(0.82)	(2.53)	(2.31)	(0.50)	(2.60)	(2.80)	(0.98)
CEO NETWORK	0.066	0.221	−0.004	0.062	0.058	−0.005	0.165	0.074	−0.000
	(0.53)	(1.57)	(−0.81)	(0.28)	(0.23)	(−0.75)	(0.73)	(0.30)	(−0.07)
TOP SOCIAL MEDIA CEO	0.439	0.079	0.013	0.726	−0.063	0.021	1.484**	1.051	0.020
	(1.22)	(0.19)	(0.88)	(1.12)	(−0.08)	(1.09)	(2.27)	(1.45)	(1.15)
MEDIA DIRECTOR	0.057	0.138	0.002	0.430*	0.540*	0.005	0.098	0.117	−0.001
	(0.42)	(0.90)	(0.38)	(1.72)	(1.90)	(0.77)	(0.39)	(0.42)	(−0.16)
All controls as baseline	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Award characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	234	234	234	232	232	232	231	231	231
Adjusted R-squared	0.944	0.929	0.774	0.823	0.774	0.759	0.826	0.790	0.767

According to our fifth hypothesis, award-winning firms are likely to attract additional analyst coverage. Malmendier and Tate (2009) find that CEO media awards are more likely to broaden CEO media visibility and hence, attract a larger coverage of financial analysts. We don't expect the same effect for firms led by non-media winning CEOs, as they will not be likely to have broadened CEO media visibility and the associated larger coverage of financial analysts.

Following Frankel et al. (2006) and He and Tian (2013, we measure analyst coverage as the average number of analysts following the firm over the year, obtained from the Institutional Brokers Estimate Systems (I/B/E/S) database. Similar to innovation and employee treatment settings, we compare the analyst coverage of an award winner's firm to a predicted winner's firm. Specifically, we construct a nearest-neighbor matching estimator based on firm characteristics described in the baseline models in Table 4.[15] We then compare the average ex post performance of award winners to the average among all non-winning CEOs. We use the regression framework to examine the impact of winning CEO awards on analyst coverage. Table 8 presents the regression results after the matching.

In our regression framework, the independent variable is the number of analysts following a firm (ANALYST_COV) obtained from the I/B/E/S database. Our key variable of interest is MEDIA (NON_MEDIA), which is equal to one if the CEO is a winner of a media (non-media) award competition and zero if the CEO is a predicted winner of a media (non-media) award. Panel A reports results for the non-media awards and Panel B reports results for the media awards.

[15] We use firm characteristics to construct matching estimators because Bhushan (1989) suggests that firm characteristics are major determinants of the number of analysts following a firm.

Table 6
Potential benefits from award-winning. This table reports the regression results for the sample that includes winners and predicted winners. Predicted winners (P) are chosen from the non-winners (N) as those with the propensity scores closest to those of each actual award winner (W). The dependent variable is growth opportunities, measured as TOBIN_Q (market value of equity plus total assets minus the book value of equity, all divided by total assets). The independent variables include MEDIA (a dummy variable equal to one if the CEO won at least one media award in year t and zero otherwise); NON_MEDIA (a dummy variable equal to one if the CEO won at least one non-media award in year t and zero otherwise); $RETURN_{t-1}$ and $RETURN_{t-2}$ (the compound returns from one and two years prior to the award year t, respectively); SIZE (the logarithm of the total book value of assets); RD_{t-1} (the previous year's annual R&D expenditure scaled by the total book value of assets); LEVERAGE (the ratio of total debt to book assets); ROA (the ratio of operating income to book assets); CASH (measured as cash and assets readily convertible to cash, scaled by book assets); AD_EXPENSE is the ratio of advertising expense to book assets; SG&A is the ratio of aggregated selling, general, and administrative expenses scaled by book assets. Industry dummies, year dummies, and lagged values of dependent variables are not reported for brevity. The *t*-statistics are reported in parentheses. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Tobin's Q	
	NONMEDIA (1)	MEDIA (2)
NONMEDIA/ MEDIA	0.332**	0.204**
	(2.30)	(2.36)
$RETURN_{t-1}$	0.234***	1.653***
	(5.20)	(15.98)
$RETURN_{t-2}$	−0.019	−0.022
	(−0.34)	(−0.65)
$SIZE_{t-1}$	−0.045	−0.053
	(−0.70)	(−1.38)
RD_{t-1}	1.449	2.271**
	(1.10)	(2.16)
$LEVERAGE_{t-1}$	−0.224	−0.353
	(−0.41)	(−1.15)
ROA_{t-1}	1.931**	−0.772
	(2.53)	(−1.38)
$CASH_{t-1}$	1.732***	1.027***
	(3.58)	(2.94)
$ANALYST\_COV_{t-1}$	0.037***	0.006
	(3.40)	(0.85)
$AD\_EXPENSE_{t-1}$	−2.734*	1.373
	(−1.80)	(1.48)
$SG\&A_{t-1}$	1.895***	−0.584**
	(4.00)	(−2.18)
CEO_AGE	0.729	−1.040**
	(0.97)	(−2.40)
CEO_TENURE	0.039	−0.091
	(0.44)	(−1.49)
FEMALE	−0.179	0.097
	(−0.51)	(0.76)
Lagged value of dependent variable	Yes	Yes
Year dummies	Yes	Yes
Industry dummies	Yes	Yes
No. of observations	458	583
Adjusted R-squared	0.597	0.793

According to Panel B of Table 8, the coefficients on NON_MEDIA in each of the three years after the award year are not significantly different from zero, suggesting that there is no evidence for an increase in analyst coverage following CEO personal non-media awards. In contrast, according to Panel A's results, the coefficients on MEDIA are positive and statistically significant at the 1% level in each of the three years after the award year. The results show that there is a significantly higher number of analysts following a firm after its CEO wins a media award. This finding is aligned with Malmendier and Tate (2009) as CEO

Table 7
Abnormal Google search volume surrounding the award weeks. This table reports the Abnormal Google Search Volume (ASVI) surrounding the award weeks. Following Da et al. (2011), ASVI is defined as the difference between the logarithm of SVI during week *t* and the logarithm of the median value of SVI during the prior 8 weeks. *t*-statistics are reported in parentheses. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	ASVI *t*				
	Week 1	Week 2	Week 4	Week 12	Week 24
Media-award winning CEOs	2.412***	1.338***	0.693**	0.341	−0.242
	(8.89)	(4.61)	(2.29)	(1.23)	(−1.38)
Non-media award winning CEOs	1.313***	−0.097	−0.120	−0.057	0.219
	(4.12)	(−0.37)	(−0.49)	(−0.23)	(0.86)
Difference in mean	1.099***	1.434***	0.812**	0.398	−0.462
	(2.64)	(3.60)	(2.04)	(1.05)	(1.54)

media awards are more likely to broaden CEO media visibility and hence, attract a larger coverage of financial analysts. As suggested by He and Tian (2013), increasing analyst coverage exerts more pressure on managers to meet short-term goals and hence, impedes the firm's long-term innovation projects. This finding is consistent with our previous findings that firms led by media award winners generate less innovation success.

6.3. Impact of winning CEO awards on employee treatment

Employees are key organizational assets (Zingales, 2000; Maslow, 1943; Herzberg et al., 1959) and key sources of value creation by inventing new products or building client relationships. Focusing on corporate innovative activities, Chen et al. (2016b) document that firms with an employee-friendly workplace are associated with greater innovative success. Similarly, they find that firms with better employee treatment schemes generate more and better patents. Given that human capital plays an essential role in innovative outputs (Hall, 2002), we examine the potential impact of winning CEO awards on employee treatment.

We start by constructing the employee relations score based on the KLD database. Following Bae et al. (2011) and Lins et al. (2017), we construct an employee relations score (RELATION_SCORE) using the strength and concern categories of employee relations. The KLD database assigns a binary rating for each category for each firm-year. As the number of strengths and concerns for each ESG category varies over time, we follow Servaes and Tamayo (2013) and Lins et al. (2017) and scale the strengths (concerns) for the employee relation category by dividing the number of strengths (concerns) for each firm year by the maximum number of strengths (concerns) possible for each category year. The value for employee relation category (RELATION_SCORE), measured by subtracting the concerns index from the strength index, ranges from −1 to +1, with a higher value indicating better employee treatment.

To minimize an endogeneity concern that a change in the employee treatment relation of the firm could arise from firm characteristics and not necessarily from the status change following CEO personal awards, following Malmendier and Tate (2009), we compare the employee relation score of an award winner's firm to a predicted winner's firm. Specifically, we construct a nearest-neighbor matching estimator based on firm characteristics described in the baseline models in Table 4. We then compare the average ex post performance of award winners to the average among all non-winning CEOs. We use the regression framework

Table 8
Impact of winning CEO awards on analyst coverage. This table reports the regression results for the sample that includes winners and predicted winners. Predicted winners (P) are chosen from the non-winners (N) as those with the propensity scores closest to those of each actual award winner (W). Panels A and B report the results for non-media and media awards, respectively. The dependent variables are ANALYST_COV, where ANALYST_COV is the average number of analysts following the firm over the year, obtained from the Institutional Brokers Estimate Systems (I/B/E/S) database. The independent variables include MEDIA (a dummy variable equal to one if the CEO won at least one media award in year t and zero otherwise); NON_MEDIA (a dummy variable equal to one if the CEO won at least one non-media award in year t and zero otherwise); $RETURN_{t-1}$ and $RETURN_{t-2}$ (the compound returns from one and two years prior to the award year t, respectively); SIZE (the logarithm of the total book value of assets); TOBIN_Q (market value of equity plus total assets minus the book value of equity, all divided by total assets); RD_{t-1} (the previous year's annual R&D expenditure scaled by the total book value of assets); LEVERAGE (the ratio of total debt to book assets); ROA (the ratio of operating income to book assets); CASH (measured as cash and assets readily convertible to cash, scaled by book assets); AD_EXPENSE is the ratio of advertising expense to book assets; SG&A is the ratio of aggregated selling, general, and administrative expenses scaled by book assets; CEO_AGE (the age of CEOs in years); CEO_TENURE (the number of years since the current CEO became CEO), and FEMALE (a dummy variable that equals one if the CEO is female and zero otherwise). Industry dummies, year dummies, and lagged values of dependent variables are not reported for brevity. The *t*-statistics are reported in parentheses. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	1 year after the award year $ANALYST\_COV_{t+1}$	**2 years after the award year** $ANALYST\_COV_{t+2}$	**3 years after the award year** $ANALYST\_COV_{t+3}$
Panel A: Media Awards			
MEDIA	0.845**	1.391***	2.427***
	(2.14)	(2.90)	(4.26)
$RETURN_{t-1}$	1.017***	1.612***	1.220***
	(3.83)	(4.91)	(3.15)
$RETURN_{t-2}$	−0.067	−0.198	−0.075
	(−0.48)	(−1.16)	(−0.37)
$SIZE_{t-1}$	0.766***	1.305***	1.275***
	(4.63)	(6.48)	(5.31)
$TOBIN\_Q_{t-1}$	51.894***	65.733***	69.871***
	(5.12)	(5.32)	(4.79)
RD_{t-1}	2.503	−5.550	−2.077
	(0.59)	(−1.08)	(−0.34)
$LEVERAGE_{t-1}$	−0.226	0.616	3.325*
	(−0.17)	(0.37)	(1.68)
ROA_{t-1}	−2.639	−1.532	−0.506
	(−1.11)	(−0.54)	(−0.15)
$CASH_{t-1}$	1.225	3.979**	2.798
	(0.78)	(2.08)	(1.23)
$AD\_EXPENSE_{t-1}$	4.759	10.387**	10.178*
	(1.17)	(2.12)	(1.74)
$SG\&A_{t-1}$	−3.598***	−3.648**	−3.562*
	(−2.86)	(−2.31)	(−1.89)
CEO_AGE	−3.666**	−5.595**	−7.621***
	(−2.04)	(−2.58)	(−2.94)
CEO_TENURE	0.510*	1.160***	1.370***
	(1.95)	(3.66)	(3.62)
FEMALE	−1.607***	−1.995***	−2.389***
	(−2.81)	(−2.86)	(−2.86)
Lagged value of dependent variable	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
No. of observations	597	586	580
Adjusted R-squared	0.872	0.821	0.765
Panel B: Non-media Awards			
NON_MEDIA	0.326	0.287	0.173
	(0.86)	(0.59)	(0.29)

Table 8 (*continued*)

	1 year after the award year $ANALYST\_COV_{t+1}$	**2 years after the award year** $ANALYST\_COV_{t+2}$	**3 years after the award year** $ANALYST\_COV_{t+3}$
$RETURN_{t-1}$	0.214	0.293	0.235
	(1.21)	(1.29)	(0.86)
$RETURN_{t-2}$	0.585	0.452	0.941
	(1.44)	(0.87)	(1.48)
$SIZE_{t-1}$	0.445**	0.981***	1.320***
	(2.56)	(4.35)	(4.83)
$TOBIN\_Q_{t-1}$	13.616	27.247**	31.776**
	(1.45)	(2.28)	(2.15)
RD_{t-1}	−1.229	6.783	6.611
	(−0.33)	(1.42)	(1.14)
$LEVERAGE_{t-1}$	−1.462	1.244	1.236
	(−1.08)	(0.72)	(0.55)
ROA_{t-1}	2.834	1.968	2.579
	(1.12)	(0.61)	(0.62)
$CASH_{t-1}$	1.088	1.761	1.955
	(0.74)	(0.94)	(0.85)
$AD\_EXPENSE_{t-1}$	5.231	12.243**	2.250
	(1.11)	(2.06)	(0.30)
$SG\&A_{t-1}$	−2.890**	−3.175**	−2.254
	(−2.28)	(−1.98)	(−1.16)
CEO_AGE	−2.586	−6.186**	−2.404
	(−1.24)	(−2.35)	(−0.75)
CEO_TENURE	0.255	0.107	0.190
	(1.01)	(0.33)	(0.49)
FEMALE	0.256	0.754	0.615
	(0.31)	(0.71)	(0.48)
Lagged value of dependent variable	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
No. of observations	465	454	440
Adjusted R-squared	0.885	0.812	0.728

to examine the impact of winning CEO awards on employee treatment schemes. Table 9 presents the regression results after the matching.

In our regression framework, the dependent variable is employee treatment measured by RELATION_SCORE. Our key variable of interest is MEDIA (NON_MEDIA), which is equal to one if the CEO is a winner of a media (non-media) award competition and zero if the CEO is a predicted winner of a media (non-media) award. Panel A reports results for media awards and Panel B reports results for non-media awards.

In Panel A of Table 9, the coefficients for MEDIA in each of the three years after the award year are not significant. The results suggest that there is no evidence for improvements in employee treatment following CEO personal media awards. Again, these findings are in line with our findings that a difference in corporate innovation outputs between media award-winning CEOs and a matched sample of non-winners is either insignificant or weak.

Regarding non-media awards, according to Panel B of Table 9, the coefficients on NON-MEDIA in each of the two years after the award year are positive and statistically significant, suggesting that firms, as induced by the status change following CEO personal non-media awards, exhibit a better employee treatment.[16] As the employees are the engine to innovation, enhancing employee treatment can result in better employee commitment and productivity, which eventually leads to higher innovation success. These results are consistent with both

[16] The results are stronger for the first two years and weaker for the third year after the award year, which is consistent with the short-term impact of the status change following CEO personal awards.

Table 9
Impact of winning CEO awards on employee treatment. This table reports the regression results for the sample that includes winners and predicted winners. Predicted winners (P) are chosen from the non-winners (N) as those with the propensity scores closest to those of each actual award winner (W). Panels A and B report the results for non-media and media awards, respectively. The dependent variables are RELATION_SCORE, where RELATION_SCORE is employee relations score constructed based on the MSCI/KLD database, following Lins et al. (2017). The independent variables include MEDIA (a dummy variable equal to one if the CEO won at least one media award in year t and zero otherwise); NON_MEDIA (a dummy variable equal to one if the CEO won at least one non-media award in year t and zero otherwise); $RETURN_{t-1}$ and $RETURN_{t-2}$ (the compound returns from one and two years prior to the award year t, respectively); SIZE (the logarithm of the total book value of assets); TOBIN_Q (market value of equity plus total assets minus the book value of equity, all divided by total assets); RD_{t-1} (the previous year's annual R&D expenditure scaled by the total book value of assets); LEVERAGE (the ratio of total debt to book assets); ROA (the ratio of operating income to book assets); CASH (measured as cash and assets readily convertible to cash, scaled by book assets); AD_EXPENSE is the ratio of advertising expense to book assets; SG&A is the ratio of aggregated selling, general, and administrative expenses scaled by book assets. Industry dummies, year dummies, and lagged values of dependent variables are not reported for brevity. The *t*-statistics are reported in parentheses. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	1 year after the award year $RELATION\_SCORE_{t+1}$	**2 years after the award year** $RELATION\_SCORE_{t+2}$	**3 years after the award year** $RELATION\_SCORE_{t+3}$
Panel A: Media Awards			
MEDIA	0.038	−0.052	−0.051
	(1.28)	(−1.32)	(−1.21)
$RETURN_{t-1}$	−0.048*	−0.060*	−0.092**
	(−1.76)	(−1.67)	(−2.36)
$RETURN_{t-2}$	0.028	−0.011	0.027
	(1.30)	(−0.37)	(0.84)
$SIZE_{t-1}$	−0.003	0.026*	0.036**
	(−0.25)	(1.80)	(2.31)
$TOBIN\_Q_{t-1}$	0.477	0.436	1.282
	(0.83)	(0.55)	(1.45)
RD_{t-1}	0.149	0.468	−0.073
	(0.60)	(1.39)	(−0.20)
$LEVERAGE_{t-1}$	0.011	0.078	0.108
	(0.15)	(0.74)	(0.98)
ROA_{t-1}	0.006	−0.088	−0.046
	(0.04)	(−0.50)	(−0.24)
$CASH_{t-1}$	0.030	0.049	−0.028
	(0.32)	(0.39)	(−0.21)
$ANALYST\_COV_{t-1}$	0.001	−0.001	−0.001
	(0.51)	(−0.38)	(−0.55)
$AD\_EXPENSE_{t-1}$	0.122	0.375	0.042
	(0.57)	(1.33)	(0.14)
$SG\&A_{t-1}$	−0.071	−0.076	−0.015
	(−0.88)	(−0.70)	(−0.13)
CEO_AGE	−0.082	−0.032	−0.007
	(−0.67)	(−0.19)	(−0.04)
CEO_TENURE	0.029*	0.027	0.033
	(1.72)	(1.20)	(1.40)
FEMALE	0.034	0.096*	0.086
	(0.88)	(1.86)	(1.54)
Lagged value of dependent variable	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
No. of observations	309	296	289
Adjusted R-squared	0.591	0.406	0.403
	1 year after the award year $RELATION\_SCORE_{t+1}$	**2 years after the award year** $RELATION\_SCORE_{t+2}$	**3 years after the award year** $RELATION\_SCORE_{t+3}$
Panel B: Non-media Awards			
NON_MEDIA	0.054**	0.046*	0.019
	(2.15)	(1.70)	(0.65)
$RETURN_{t-1}$	−0.050*	0.002	−0.020
	(−1.68)	(0.05)	(−0.45)
$RETURN_{t-2}$	0.047**	0.012	−0.011
	(2.12)	(0.51)	(−0.42)
$SIZE_{t-1}$	−0.016	−0.006	−0.004
	(−1.60)	(−0.40)	(−0.26)
$TOBIN\_Q_{t-1}$	−0.252	0.398	1.894**
	(−0.38)	(0.51)	(2.12)
RD_{t-1}	−0.546**	−0.378	−0.083
	(−2.19)	(−1.25)	(−0.21)
$LEVERAGE_{t-1}$	0.053	0.085	0.292**
	(0.62)	(0.81)	(2.09)
ROA_{t-1}	0.216*	0.001	0.048
	(1.69)	(0.01)	(0.45)
$CASH_{t-1}$	0.148**	0.228**	0.096
	(2.17)	(2.26)	(0.90)
$ANALYST\_COV_{t-1}$	0.004**	0.005**	0.002
	(2.09)	(2.01)	(0.73)
$AD\_EXPENSE_{t-1}$	0.074	0.236	0.242
	(0.31)	(0.88)	(0.81)

(*continued on next page*)

Table 9 (*continued*)

Panel B: Non-media Awards	1 year after the award year RELATION_SCORE$_{t+1}$	2 years after the award year RELATION_SCORE$_{t+2}$	3 years after the award year RELATION_SCORE$_{t+3}$
SG&A $_{t-1}$	−0.033	−0.064	−0.048
	(−0.49)	(−0.73)	(−0.45)
CEO_AGE	−0.137	−0.084	−0.144
	(−1.04)	(−0.55)	(−0.89)
CEO_TENURE	−0.002	−0.009	0.025
	(−0.13)	(−0.62)	(1.33)
FEMALE	0.022	0.041	0.032
	(0.33)	(0.63)	(0.41)
Lagged value of dependent variable	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
No. of observations	214	210	209
Adjusted R-squared	0.655	0.463	0.483

Hypothesis 6 and our previous findings that firms led by non-media award winners generate better corporate innovative activities.[17]

6.4. Impact of winning CEO awards on inventors

Attracting talent could be a possible channel through which changes in CEO status can affect innovation outputs. The patent data of Kogan et al. (2017) does not provide the inventors' information. To conduct an empirical analysis on the potential impact of winning non-media awards on attracting innovators, we rely on the inventor data from the United State Patent and Trademark Office (USPTO). Similar to previous analyses, to minimize an endogeneity concern that a change in the number of inventors of the firm could arise from firm characteristics and not necessarily from the status change following CEO personal awards, following Malmendier and Tate (2009), we compare the number of inventors of an award winner's firm to a predicted winner's firm. Specifically, we construct a nearest-neighbor matching estimator based on firm characteristics described in the baseline models in Table 4. We then compare the average ex post performance of award winners to the average among all non-winning CEOs. We use the regression framework to examine the impact of winning CEO awards on the number of inventors. Table 10 presents the regression results after the matching.

In our regression framework, the dependent variable is the number of inventors (denoted Ln(1+INVENTORS), measured as the natural logarithm of one plus the number of inventors. Our key variable of interest is NON_MEDIA, which is equal to one if the CEO is a winner of a non-media award competition and zero if the CEO is a predicted winner of a non-media award. We find that the coefficient on NON-MEDIA is positive and statistically significant, suggesting that firms, as induced by the status change following CEO personal non-media awards, tend to attract more inventors. We focus our analyses on the first year after a CEO win an award to allow new inventors to contribute to their firms' innovation activities in the following years. As the employees are the engine to innovation, enhancing employee treatment can result in better employee commitment and productivity, which eventually leads to higher innovation success. These results are consistent with our previous findings that firms led by non-media award winners generate better corporate innovative activities.[18] Furthermore, the coefficient for media awards is not significant, suggesting that there is no evidence for an increase in the number of inventors following CEO personal media awards. Again, these findings are in line with our findings that a difference in corporate innovation outputs between media award-winning CEOs and a matched sample of non-winners is insignificant.

7. Differences between media and non-media awards

In order to investigate if there are differences between innovation outcomes of media and non-media awards, we conduct a test for the differences between the two coefficients on MEDIA and NONMEDIA. Specifically, we employ the seemingly unrelated estimation (SUR) and the Wald test for the coefficient differences between the two samples (Zellner, 1962). We report the results for these tests in Table 11.

Columns (1) to (4) report the results for innovation outputs, measured by PATENT and CITATION. These tests are for the second year

[17] We also consider several additional analyses. First, we examine the potential impact of winning non-media awards on the pricing of bank loans. We report the results for these analyses in Table A8 in the Internet Appendix. We find some weak evidence that banks, on average, charge lower loan costs for firms after their CEOs win a non-media award. However, the coefficient is not statistically significant at the 10%-level, which is probably caused by the small sample (e.g., the number of observations is less than 100). Second, we examine the impact of winning non-media awards on the implied cost of equity. To measure equity costs, we use the equally-weighted average of four commonly-employed implied cost of equity measures, including the measures of Gode and Mohanram (2003), Claus and Thomas (2001), Gebhardt, Lee, and Swaminathan (2001), and Easton (2004). We report the results for these analyses in Table A-9 in the Internet Appendix. We find that firms, as induced by the status change following CEO personal non-media awards, exhibit a lower equity cost of capital in the first year after the awards and the effect is weaker for the second and third year after the award year. These results are consistent with the short-term impact of the status change following CEO personal awards. Collectively, these results and Table 10's results suggest that the status of the CEO influence their firms' innovative activities by, at least, partly enhancing long-term innovation investments and promoting human capital.

[18] In addition to empirical evidence, we have found several examples from media search on the possible relation between the status changes, induced by CEOs' non-media awards, and talent recruitments. For example, John Warnock and Chuck Geschke, co-founders and CEO of Adobe Systems, won the American Electronics Association' Medal of Achievement in 2006. In 2007, several science talents joined Adobe, including Wojciech Matusik (received a PhD at MIT and now Professor of Electrical Engineering and Computer Science at MIT, available at: http://people.csail.mit.edu/wojciech/, retrieved on May 23, 2023), and Sylvain Paris (a researcher at Adobe Research, available at: https://research.adobe.com/person/sylvain-paris/, retrieved on April 30, 2020). Another example includes Norman Augustine, a former Chairman and CEO of Lockheed Martin Corporate, who received the NASA Distinguished Public Service Medal (one of the highest honors from NASA) in 1997 (available at: https://www.nasa.gov/offices/hsf/members/augustine_bio.html, retrieved on May 23, 2023). Chris Dorosky joined Lockheed Martin in 1998 as a software engineer. Chris is now the Engineering and Technology Manager at Lockheed Martin Corporate (available at: https://www.linkedin.com/in/chris-dorosky-aa65405, retrieved on May 23, 2023). We urge caution when interpreting these examples as (i) the decision to join a company is likely to be driven by a range of (both observed and unobserved) factors and (ii) the lack of data and empirical analyses does allow us to establish a causal link. Anecdotal evidence, however, further suggest that there may be an association between CEOs' non-media awards and talent recruitments, which can serve as the engine to innovation.

Table 10
Impact of winning CEO awards on inventors. This table reports the regression results for the sample that includes winners and predicted winners. Predicted winners (P) are chosen from the non-winners (N) as those with the propensity scores closest to those of each actual award winner (W). The dependent variable is the number of inventors, measured as the natural logarithm of one plus the number of inventors. We source inventor data from the United State Patent and Trademark office (USPTO). The independent variables include MEDIA (a dummy variable equal to one if the CEO won at least one media award in year t and zero otherwise); NON_MEDIA (a dummy variable equal to one if the CEO won at least one non-media award in year t and zero otherwise); $RETURN_{t-1}$ and $RETURN_{t-2}$ (the compound returns from one and two years prior to the award year t, respectively); SIZE (the logarithm of the total book value of assets); TOBIN_Q (market value of equity plus total assets minus the book value of equity, all divided by total assets); RD_{t-1} (the previous year's annual R&D expenditure scaled by the total book value of assets); LEVERAGE (the ratio of total debt to book assets); ROA (the ratio of operating income to book assets); CASH (measured as cash and assets readily convertible to cash, scaled by book assets); AD_EXPENSE is the ratio of advertising expense to book assets; SG&A is the ratio of aggregated selling, general, and administrative expenses scaled by book assets. Industry dummies, year dummies, and lagged values of dependent variables are not reported for brevity. The *t*-statistics are reported in parentheses. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	Dependent variable: Ln(1+Inventors)	
	NONMEDIA	MEDIA
NONMEDIA/ MEDIA	0.343***	0.110
	(3.45)	(1.22)
$RETURN_{t-1}$	0.030	0.159*
	(1.16)	(1.89)
$RETURN_{t-2}$	0.028	0.120**
	(0.88)	(2.10)
$SIZE_{t-1}$	−0.085	0.152***
	(−1.42)	(2.86)
$TOBIN\_Q_{t-1}$	4.733**	9.190***
	(2.11)	(3.50)
RD_{t-1}	−0.823	−0.145
	(−0.85)	(−0.13)
$LEVERAGE_{t-1}$	0.750	−0.061
	(1.55)	(−0.18)
ROA_{t-1}	0.794	−0.452
	(1.53)	(−0.79)
$CASH_{t-1}$	0.574	0.030
	(1.59)	(0.08)
$ANALYST\_COV_{t-1}$	0.010	−0.008
	(1.46)	(−1.17)
$AD\_EXPENSE_{t-1}$	−3.060**	−4.033***
	(−2.50)	(−3.44)
$SG\&A_{t-1}$	0.254	−0.346
	(0.66)	(−1.04)
CEO_AGE	0.334	−0.977**
	(0.62)	(−2.30)
CEO_TENURE	0.049	0.093
	(0.78)	(1.37)
FEMALE	0.021	−0.006
	(0.07)	(−0.04)
Lagged value of dependent variable	Yes	Yes
Year dummies	Yes	Yes
Industry dummies	Yes	Yes
No. of observations	260	341
Adjusted R-squared	0.931	0.937

after the award year where we start to observe differences in innovation outputs for media and non-media awards winners.[19] Columns (5) to (6) report the results for analyst coverage while Columns (7) to (8) report the results for employee relations as possible channels. The tests for the two channels are for the first year after the award year so that these mechanisms can influence corporate innovation outputs in the subsequent years. Overall, the analyses consistently suggest that firms led by non-media award winners are associated with greater innovation outputs, both in terms of patents and citations. We also find, compared to media winners, firms headed by non-media award winners are associated with less analyst coverage and more favourable employee treatment following an award.

8. Further analyses

To further understand the impacts of award-winning on corporate outcomes, we conduct several additional analyses. *First*, we consider the stock performance of award winners and predicted winners. Specifically, following Ammann et al. (2016), we compute the cumulative abnormal returns (CAR) around the event date, using a market model with the CRSP value-weighted index as the proxy for market return and a three-year estimation period ending 23 days prior to the award [−775, −23]. As the event window, we consider the eleven trading days surrounding the award announcement days [−5, +5], with day 0 as the event date. For the long-run reactions, we consider one year [+6, +255], two years [+6, +510], and three years [+6, +765] following the award. We report the results for these tests in Table 12.

We find no evidence of a short-term market reaction to media awards, with the return difference between media award winners and predicted winners of 0.00067 (*t*-statistic of 0.99). However, there is evidence that media award winners underperform in the long run. Specifically, the return differences between winners and predicted winners over two years and three years following the awards are −0.1998 (*t*-statistic of −1.86) and −0.3479 (*t*-statistic of −2.01), respectively. These findings are aligned with Malmendier and Tate (2009), suggesting that CEOs are likely to be distracted after winning media awards, leading to firm underperformance several years following the awards. In addition, we find no evidence of both short-term and long-term market reactions to non-media awards. Thus, the results suggest no evidence of distraction-induced firm underperformance after winning non-media awards. *Second*, we examine the impact of winning CEO awards on CEO overconfidence. Following Hirshleifer et al. (2012) and Campbell et al. (2011), we use an options-based measure of CEO overconfidence (HOLDER_67), which is an indicator variable that equals 1 for all years after a CEO holds options that are at least 67% in the money, and 0 otherwise. We report the results for these tests in Columns (1) to (2) in Table 13.

The results of Table 13 suggest evidence that winners of media awards are more likely to become overconfident (Column 1) while there is no evidence of overconfidence among non-media award winners (Column 2).

Third, we further investigate the impact of winning CEO awards on risk-taking. Following Ammann et al. (2016), we use return volatility (RETVOL) to capture risk-taking. RETVOL is the standard deviation of daily stock returns during the fiscal year, following Hirshleifer et al. (2012).[20] Firms led by media award winners tend to exhibit higher return volatility (Column 3). We find no evidence of higher risk-taking among firms led by non-media award winners (Column 4).

Fourth, we examine the impact of winning CEO awards on operating performance. Following Malmendier and Tate (2009) and Ammann et al. (2016), we consider two measures of operating performance, i.e. the return-on-asset ratio (ROA) and sale growth (SALE_GROWTH).[21] We report the results for these analyses in Columns (5) to (8) in Table 13.

[19] The results (untabulated for brevity) are quantitatively similar for the third year after the award year.

[20] As an alternative measure of risk-taking, we use idiosyncratic volatility (IDIOVOL), measured based on the Fama-French-Cahart 4-factor model, following Ang, Hodrick, Xing, and Zhang (2006). The results (untabulated for brevity) are qualitatively unchanged.

[21] As an alternative measure of operating performance, we also consider changes in ROA (DROA). We find our results (untabulated for brevity) are not sensitive to different measures of operating performance.

Table 11
Test for differences in coefficients between media and non-media awards. This table reports the results for the seemingly unrelated estimation (SUR) and the Wald test for the coefficient differences between the two samples. The independent variables include MEDIA (a dummy variable equal to one if the CEO won at least one media award in year *t* and zero otherwise) and NON_MEDIA (a dummy variable equal to one if the CEO won at least one non-media award in year *t* and zero otherwise) and a set of control variables for CEO and firm characteristics as well as award selection criteria identical to those in Table 4 (not reported here for brevity). Columns (1) to (4) report the results for innovation outputs. PATENT is the logarithm of one plus the number of patents applied for during the year and CITATION is the logarithm of one plus the number of citations per patent. Columns (5) to (6) report the results for analyst coverage while Columns (7) to (8) report the results for employee ration as possible channels. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	Innovation				Analyst coverage		Employee relation	
	PATENT		CITATION		ANALYST_COV		RELATION_SCORE	
	NONMEDIA	MEDIA	NONMEDIA	MEDIA	NONMEDIA	MEDIA	NONMEDIA	MEDIA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coefficient	0.328**	0.007	0.538***	−0.113	0.326	0.845**	0.054*	0.038
	(2.16)	(0.13)	(3.53)	(−1.29)	(0.86)	(2.14)	(2.15)	(1.28)
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SUR & Wald Test for differences in coefficients:								
χ^2 Test	12.09***		20.45***		3.85**		5.52**	
(p-value)	(0.01)		(0.00)		(0.05)		(0.02)	

Table 12
Stock performance of award winners and predicted winners. This table reports the stock performance of award winners and predicted winners. Predicted winners (P) are chosen from the non-winners (N) as those with the propensity scores closest to those of each actual award winner (W). Panel A reports the results for media awards while Panel B reports the results for non-media awards. We compute the cumulative abnormal returns (CAR) around the event date, using a market model with the CRSP value-weighted index as the proxy for market return and a three-year estimation period ending 23 days prior to the award [−775, −23]. As the event window, we consider the eleven trading days surrounding the award announcement days [−5, +5], with day 0 as the event date. For the long-run reactions, we consider one year [+6, +255], two years [+6, +510], and three years [+6, +765] following the award. The *t*-statistics are reported in parentheses. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Media award Event window	Media Award winner (W)	Predicted winner (P)	Difference (W - P)
[−5, +5]	−0.0017	−0.0084	0.00067
	(−0.46)	(−1.34)	(0.99)
[+6, +255]	−0.1697***	−0.0732***	−0.0965
	(−2.76)	(−2.96)	(−1.63)
[+6, +510]	−0.3397***	−0.1398***	−0.1998*
	(−2.97)	(−3.45)	(−1.86)
[+6, +765]	−0.5610***	−0.2131***	−0.3479**
	(−3.44)	(−3.61)	(−2.01)
Panel B: Non-media Award Event window	**Non-media Award winner (W)**	**Predicted winner (P)**	**Difference (W - P)**
[−5, +5]	0.0033	−0.0078	0.0111
	(0.56)	(−1.21)	(1.28)
[+6, +255]	−0.0612**	−0.0482	−0.0130
	(−2.25)	(−1.42)	(−0.30)
[+6, +510]	−0.1669***	−0.1127**	−0.0542
	(−3.36)	(−2.13)	(−0.73)
[+6, +765]	−0.2925***	−0.2144***	−0.0781
	(−4.51)	(−2.90)	(−0.79)

Overall, consistent with Malmendier and Tate (2009), we find no significant difference in operating performance in the short run between winners and non-predicted winners.

Fifth, we further examine the impact of media and non-media awards on the level of distraction of CEOs by considering their firms' earnings management practices. Prior studies (e.g., Malmendier and Tate (2009)) suggest that the magnitude of earnings management can, at least partly, proxy for the level of distraction. Our measures of earnings management include both accrual-based earnings management and real earnings management. To capture accrual-based earnings management, we follow Dechow et al. (1995) and use absolute discretionary accruals, where discretionary accruals are estimated with the modified Jones (1991) model. To capture real earnings management, we follow Cohen and Zarowin (2010) and Roychowdhury (2006) and construct the aggregate real earning management measure based on abnormal discretionary expenses and abnormal cash flows from operations. We report the results for these analyses in Columns (9) to (12) in Table 13. We find evidence that firms led by media award winners are more likely to engage in earnings management while there is no evidence of earnings management among firms led by non-media award winners. Thus, consistent with Malmendier and Tate (2009), our results suggest more distraction following winning media awards, which leads to higher earnings management in the subsequent year.

Furthermore, we conduct several subsample analyses based on the levels of corporate governance to further test for the distraction channels. Our results (untabulated for brevity) suggest that the impact of winning CEO awards on earnings management is concentrated in the subsample of poorly governed firms. In addition, the impacts of winning CEO awards on risk-taking and overconfidence are more pronounced among poorly governed samples.

9. Conclusion

This study builds on previous literature on the effects that award-winning CEOs have on corporate performance. Whereas previous studies look at the impact on stock returns and operating performance, our study investigates the impact of awards on corporate innovation. We also extend the previous literature by looking at not only media awards

Table 13

Impact of winning CEO awards on overconfidence, risk taking, operating performance, and earnings management. This table reports the regression results for the sample that includes winners and predicted winners. Predicted winners (P) are chosen from the non-winners (N) as those with the propensity scores closest to those of each actual award winner (W). The dependent variables include the options-based measure of CEO overconfidence (HOLDER_67) in Columns (1–2), return volatility (RETVOL) in Columns (3–4), operating performance, measured by return-on-asset ratio (ROA) and sale growth (SALE_GROWTH) in Columns (5–8), and earnings management measured by both accrual-based earnings management and real earnings management in Columns (9–12). HOLDER_67 is an indicator variable that equals 1 for all years after a CEO holds options that are at least 67% in the money, and 0 otherwise. We follow Hirshleifer et al. (2012) to estimate the HOLDER_67 variable. RETVOL is the standard deviation of daily stock returns during the fiscal year, following Hirshleifer et al. (2012) and Ammann et al. (2016). To capture accrual-based earnings management, we follow Dechow et al. (1995) and use absolute discretionary accruals, where discretionary accruals are estimated with the modified Jones (1991) model. To capture real earnings management, we follow Cohen and Zarowin (2010) and Roychowdhury (2006) and construct the aggregate real earning management measure based on abnormal discretionary expenses and abnormal cash flows from operations. The independent variables include MEDIA (a dummy variable equal to one if the CEO won at least one media award in year t and zero otherwise); NON_MEDIA (a dummy variable equal to one if the CEO won at least one non-media award in year t and zero otherwise); $RETURN_{t-1}$ and $RETURN_{t-2}$ (the compound returns from one and two years prior to the award year t, respectively); SIZE (the logarithm of the total book value of assets); RD_{t-1} (the previous year's annual R&D expenditure scaled by the total book value of assets); LEVERAGE (the ratio of total debt to book assets); ROA (the ratio of operating income to book assets); CASH (measured as cash and assets readily convertible to cash, scaled by book assets); AD_EXPENSE is the ratio of advertising expense to book assets; SG&A is the ratio of aggregated selling, general, and administrative expenses scaled by book assets. Industry dummies and year dummies are not reported for brevity. The *t*-statistics are reported in parentheses. The asterisks ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	HOLDER67		RETVOL		ROA		SALE_GROWTH		Accrual-based Earnings Management		Real Earnings Management	
	MEDIA (1)	NONMEDIA (2)	MEDIA (3)	NONMEDIA (4)	MEDIA (5)	NONMEDIA (6)	MEDIA (7)	NONMEDIA (8)	MEDIA (9)	NONMEDIA (10)	MEDIA(11)	NONMEDIA (12)
NONMEDIA/ MEDIA	1.536**	0.548	0.021*	−0.003	0.003	0.008	0.016	0.032	0.048*	−0.013	0.188*	0.022
	(2.18)	(1.38)	(1.76)	(−0.17)	(0.52)	(0.60)	(0.66)	(0.84)	(1.84)	(−0.67)	(1.79)	(0.39)
RETURN	0.939	0.924	−0.022*	−0.000	0.058***	0.002	0.047***	−0.011	−0.097***	−0.004	−0.049	−0.249
	(1.10)	(1.55)	(−1.82)	(−0.07)	(8.27)	(0.59)	(2.85)	(−0.87)	(−3.97)	(−0.57)	(−0.31)	(−1.44)
RETURN	−0.981**	−0.059	−0.008	0.004	−0.003	0.004	0.005	−0.015	−0.008	0.017**	0.056	0.071
	(−2.27)	(−0.54)	(−0.85)	(0.63)	(−1.14)	(0.40)	(0.80)	(−0.95)	(−0.91)	(2.14)	(0.79)	(1.04)
SIZE	−0.759**	0.408***	−0.058***	−0.038***	0.004	−0.060***	−0.102***	0.001	−0.009	−0.003	0.011	−0.019
	(−2.45)	(2.63)	(−10.76)	(−5.19)	(1.58)	(−4.02)	(−3.75)	(0.06)	(−0.79)	(−0.34)	(0.19)	(−0.57)
TOBIN_Q	44.920*	6.062	−1.573***	−1.575***	1.023***	−0.145	2.075***	−0.530	1.117	0.688*	−0.548	−2.003
	(1.91)	(0.77)	(−4.50)	(−4.31)	(6.04)	(−0.45)	(3.21)	(−0.63)	(1.60)	(1.66)	(−0.18)	(−1.16)
RD	−35.652***	5.189*	0.613***	0.824***	−0.336***	−0.344*	0.133	−0.179	0.113	0.039	−2.382	−0.043
	(−3.34)	(1.70)	(4.09)	(5.57)	(−4.54)	(−1.84)	(0.30)	(−0.53)	(0.37)	(0.22)	(−1.65)	(−0.12)
LEVERAGE	7.374**	−0.736	0.075	0.169***	−0.051**	−0.064	−0.175*	0.025	−0.148	−0.117*	−0.228	0.294
	(2.15)	(−0.59)	(1.58)	(2.84)	(−2.09)	(−0.99)	(−1.88)	(0.18)	(−1.43)	(−1.72)	(−0.45)	(1.64)
ROA	−21.245***	5.317***	−0.066	0.028	0.344***	0.364***	−0.049	0.399*	0.007	0.029	−0.587	0.078
	(−3.43)	(2.67)	(−0.67)	(0.31)	(9.08)	(3.30)	(−0.42)	(1.86)	(0.05)	(0.27)	(−0.87)	(0.27)
CASH	0.767	0.330	−0.054	0.174***	0.019	−0.107*	0.029	−0.209	0.044	−0.014	−0.143	−0.001
	(0.22)	(0.29)	(−1.14)	(3.10)	(0.71)	(−1.90)	(0.27)	(−1.62)	(0.41)	(−0.21)	(−0.28)	(−0.00)
ANALYST_COV	−0.016	−0.058**	0.002***	0.001	0.000	0.004***	0.002	0.000	−0.002	−0.003**	0.001	0.012*
	(−0.33)	(−2.23)	(2.80)	(0.74)	(0.57)	(4.97)	(0.94)	(0.12)	(−1.37)	(−1.99)	(0.07)	(1.83)
AD_EXPENSE	22.458*	−2.809	−0.039	0.199	−0.127**	0.034	−0.426	−0.123	0.046	0.321*	−1.647	−0.909
	(1.89)	(−0.72)	(−0.36)	(1.18)	(−2.11)	(0.10)	(−0.74)	(−0.32)	(0.12)	(1.67)	(−1.46)	(−1.01)
SG&A	−10.342***	1.522	−0.047	−0.027	0.037*	0.041	−0.310*	0.071	0.039	−0.103*	−0.488	−0.201
	(−2.88)	(1.41)	(−1.17)	(−0.52)	(1.81)	(0.82)	(−1.96)	(0.60)	(0.38)	(−1.70)	(−0.86)	(−0.62)
CEO_AGE	11.407***	−1.402	−0.178***	−0.240***	0.123***	0.071	0.263	−0.164	0.049	−0.220**	0.186	−0.138
	(2.85)	(−0.65)	(−2.84)	(−2.80)	(3.84)	(0.55)	(1.53)	(−0.84)	(0.38)	(−2.24)	(0.23)	(−0.45)
CEO_TENURE	−0.324	−0.203	0.010	−0.008	−0.001	−0.014	−0.031*	0.016	−0.023	0.005	−0.010	0.034
	(−0.77)	(−0.77)	(1.19)	(−0.80)	(−0.21)	(−1.12)	(−1.66)	(0.65)	(−1.37)	(0.45)	(−0.13)	(0.72)
FEMALE	20.690	−1.297	−0.037*	−0.095**	0.003	0.000	0.031	−0.011	−0.051	−0.051	0.074	0.242
	(0.02)	(−1.62)	(−1.94)	(−2.37)	(0.30)	(0.01)	(0.39)	(−0.12)	(−1.08)	(−1.03)	(0.42)	(1.16)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	234	358	363	465	591	454	591	454	560	442	312	195
R2/Pseudo R2	0.536	0.272	0.826	0.587	0.537	0.822	0.672	0.025	0.514	0.248	0.708	0.328

but also non-media awards. We find that the difference in corporate innovation outputs between media award-winning CEOs and a matched sample of non-winners (predicted winners) is insignificant. On the other hand, we find that firms headed by winners of non-media awards generate more patents and more citations per patent in the second and third year following the award year.

Our finding that firms led by non-media award winners appear to generate more corporate innovation outputs is consistent with the view that non-media awards are a less biased (and hence better) proxy for personal competence and managerial ability. In addition, firms headed by winners of non-media awards are associated with better employee treatment and less analyst-induced pressure following the award, both of which spur innovative activities. Furthermore, as a result of the status change following CEO personal awards, firms led by non-media award winners can benefit from the CEOs' reputation and networking to attract the best talent and enjoy more favorable business commitments for risky projects, which makes investments in innovation more manageable and eventually boosts the innovative activities of firms with non-media award-winning CEOs. Non-media award winners are less likely to be the center of media attention; hence they do not suffer from the burden of celebrity.

The broader contribution of this study is that it is the first to utilize a unique set of CEOs' non-media awards in examining firm innovation outcomes. The change in status following non-media award competitions could affect various corporate decisions and stakeholder behaviors. The findings of this study provide a potentially fruitful avenue for future research that investigates stakeholders and corporate outcomes in a non-media setting.

CRediT authorship contribution statement

Mia Hang Pham: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Resources, Writing – original draft, Writing – review & editing. **Yulia Merkoulova:** Conceptualization, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. **Chris Veld:** Conceptualization, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

None.

Data availability

The authors do not have permission to share data.

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Appendix

Table A1
Variable definitions.

Variable	Definition	Source
PATENT	The logarithm of one plus the number of patents applied for during the year.	Kogan et al. (2017)
CITATION	The logarithm of one plus the number of citations per patent during the year. The number of citations is adjusted for truncation bias following Hall et al. (2001, 2005).	Kogan et al. (2017)
RD	R&D spending scaled by total assets.	Compustat
MEDIA	A dummy that equals one if the CEO won at least one media award in a given year and zero otherwise.	Marquis Who's Who, BoardEx
NON_MEDIA	A dummy that equals one if the CEO won at least one non-media award in a given year and zero otherwise.	Marquis Who's Who, BoardEx
SIZE	The logarithm of firm size, which is measured by total assets.	ExecuComp
RETURNt-1; RETURNt-2	Stock returns one or two years before the award year.	CRSP
ROA	The ratio of operating income to book assets.	Compustat
LEVERAGE	The ratio of total debt to book assets.	Compustat
CASH	Measured as cash and assets readily convertible to cash, scaled by book assets.	Compustat
TOBIN'S Q	Market value of equity plus total assets minus the book value of equity, all divided by total assets.	Compustat
AD_EXPENSE	Advertising expenses scaled by total assets.	Compustat
SG&A	Selling, general, and administrative expenses scaled by total assets.	Compustat
AGE	CEO age, measured in years.	ExecuComp
CEO_TENURE	CEO tenure, which is the number of years since the current CEO became CEO.	ExecuComp
FEMALE	A dummy that equals one if the CEO is female and zero otherwise.	ExecuComp
MBA	A dummy that takes the value of one if the CEO has an MBA degree and zero otherwise.	Marquis Who's Who, BoardEx
PHD	A dummy that equals one if the CEO has a PhD and zero otherwise	Marquis Who's Who, BoardEx

(continued on next page)

Table A1 (*continued*)

Variable	Definition	Source
IVY	A dummy that equals one if the CEO attended an Ivy League institution and zero otherwise.	Marquis Who's Who, BoardEx
FINTECH_EDUC	A dummy that takes the value of one if the CEO has a technical or financial educational background and zero otherwise.	Marquis Who's Who, BoardEx
MILITARY	A dummy that takes the value of one if the CEO served in the military and zero otherwise.	Marquis Who's Who
INVENTOR_CEO	A dummy that equals one if the CEO has his or her own patent and zero otherwise.	Marquis Who's Who, BoardEx
DEPRESSION_CEO	A dummy that takes the value of one if the CEO was born in the period from 1920 to 1929 and zero otherwise.	Marquis Who's Who, BoardEx
FOREIGN_CEO	A dummy that equals one if the CEO was born outside the United States and zero otherwise.	Marquis Who's Who, BoardEx
DELTA	Natural logarithm of one plus the dollar change in wealth associated with a 1% change in the firm's stock price.	CRSP, Compustat, Core and Guay (2002)
VEGA	Natural logarithm of one plus the dollar change in wealth associated with a 1% change in the standard deviation of the firm's returns.	CRSP, Compustat, Core and Guay (2002)
AMIHUD	Stock illiquidity measured following Amihud (2002).	CRSP
IO	Institutional ownership computed as the fraction of outstanding common shares owned by all 13F reporting institutions.	Thompson Reuters Institutional 13F
GENERAL_SKILL	General managerial skills over the executive's lifetime work experience.	Custodio et al. (2013)
G_INDEX	A dummy that equals one if the governance index of the firm is above the median governance index and zero otherwise. The governance index is from Gompers et al. (2003).	Gompers et al. (2003)
ANALYST_COV	Average number of analysts following the firm over the year.	Institutional Brokers Estimate Systems (I/B/E/S)
RELATION_SCORE	Employee relations score, computed as the sum of the rating across the five strength categories of employee relations, including employee involvement, cash profit-sharing, retirement benefits, union relations, and health and safety.	KLD/MSCI, Lins et al. (2017)
CEO NETWORK	A measure of the network centrality of a CEO.	BoardEx Eggington and McCumber (2019)
MEDIA DIRECTOR	A variable indicating if a firm has a media-linked director.	BoardEx; CRSP Di Giuli and Laux (2022)
TOP SOCIAL MEDIA CEO	A variable indicating if a CEO belongs to the Top 100 CEOs on social media.	Hootsuite

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jbankfin.2023.107075.

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