CEO Trustworthiness and Corporate Innovation: The Face Value of CEOs

Po-Hsuan Hsu   Siew Hong Teoh   Jiawen Yan

This version:
December 2025

We investigate how perceived CEO trustworthiness shapes corporate innovation under uncertainty and incomplete contracting. Drawing on the well-documented psychological evidence linking facial features to trait perception, we use a machine-learning model to construct a unique face-based measure of perceived CEO trustworthiness. This measure correlates strongly with higher employee ratings, greater shareholder support in proxy votes, and faster analyst revisions of earnings forecasts. Furthermore, firms led by more trustworthy-looking CEOs generate both a larger number of and higher-quality patents. A causal interpretation is supported by a difference-in-differences-in-differences test based on local trust crises triggered by financial fraud of geographically proximate but economically unrelated firms. Further mechanism tests suggest that trustworthy CEOs can pursue riskier projects and are also more efficient in innovation. Further evidence suggests that CEO perceived trustworthiness reduces perceived information asymmetries across stakeholders. It is associated with lower analyst forecast dispersion, a stronger sensitivity of innovation output to employee stock options, and stronger support for R&D from short-term institutional investors. Taken together, our evidence highlights the role of trust as a form of social capital that facilitates high-risk, high-return innovation.

Keywords: Trust, facial trait, artificial intelligence, patents, innovation, information asymmetry

[*] Po-Hsuan Hsu: College of Technology Management and Taipei School of Economics and Political Science, National Tsing Hua University, Email: pohsuanhsu@mx.nthu.edu.tw. Siew Hong Teoh: Anderson School of Management, UCLA, Email: steoh@anderson.ucla.edu. Jiawen Yan: NUS Business School, National University of Singapore, Email: jiawen.yan@nus.edu.sg. We are grateful for helpful comments from Vikas Agarwal, Solène Delecourt, Kenneth Huang, Omesh Kini, Mei Luo, Ting Luo, Yihui Pan, Evan Starr, Yanzhi Wang, Da Xu, Haifeng You, Minyuan Zhao, and seminar participants at the 36th Taiwan Symposium on Innovation Economics and Entrepreneurship, Georgia State University, and Tsinghua University. We also thank Chao-Jhih Liu and Long Yi for their research assistance. The authors do not have any funding to disclose.

1. Introduction

Corporate executives are responsible for negotiating and contracting with all parties in complex stakeholder networks with agency problems (Jensen and Meckling 1976). This task is especially challenging for innovation projects, which have high uncertainty, high information asymmetry, and extended payoff horizons (Aghion and Tirole 1994a, 1994b). Owing to agency problems and information asymmetry, executives who are more trusted by shareholders and employees may have greater support for risky investments in innovation. A complementary means of addressing this problem is for firms to adopt incentive systems to encourage innovation efforts and risk-taking, such as promising job security (Manso 2011; Acharya, Baghai, and Subramanian 2014). Such mechanisms still rely upon the perceived trustworthiness of the top executives. We therefore hypothesize that trustworthiness is central to both shareholder support and employee commitment to technological development.[1]

Previous research on trust and corporate management (Shleifer and Summers 1988; Dirks and Ferrin 2001; Sliwka 2007) has been largely silent on the role of executive trustworthiness in corporate innovation. In this paper, we test for such effects. Specifically, we use a machine learning model motivated by research from biology and cognitive psychology to analyze photos of faces to quantify the perceived trustworthiness of CEOs, and estimate its relationship with measures of innovative activity and success.

Humans are evolutionarily predisposed to form spontaneous impressions about others within milliseconds of viewing their faces (Willis and Todorov 2006; Todorov, Pakrashi, and Oosterhof 2009; Todorov 2017; Guilbeault et al. 2024; Guilbeault, Delecourt, and Desikan 2025). Among the perceived traits, trustworthiness stands out as one of the most salient and influential (Sutherland et al. 2013).[2] Trustworthiness is the propensity to carry through with a commitment (Oosterhof and Todorov 2008; Sutherland et al. 2013). In addition to forming quickly, the perception of

[1] In this paper, we use the terms trust, trustworthiness, and perceived trustworthiness interchangeably. They all refer to the perceptions rather than underlying true trustworthiness.
[2] Sutherland et al. (2013) find that facial impressions can be summarized by three key factors: trustworthiness, youthfulness/attractiveness, and dominance. The trustworthiness factor explains the *largest* amount of explained variance (37.76% out of total 72.38% explained by the three factors).

trustworthiness is relatively consistent across individuals and has been shown to predict a range of social and economic outcomes.[3]

CEOs are the public faces of their firms. So CEO facial features may influence how stakeholders assess the credibility of management promises about and commitment to risky, innovative projects with long-horizon payoffs. Employees who trust the CEO's commitment and vision should be more motivated to increase effort necessary for innovation, as such commitment increases prospects for appropriate compensation and job security (Ruppel and Harrington 2000; Acharya et al. 2014). Furthermore, under asymmetric information, investors may have greater faith in optimistic forecasts when made by trustworthy-looking CEOs.

Previous research has found that trust is a key determinant of investors' willingness to participate in financial markets and supply capital to firms (Guiso, Sapienza, and Zingales 2008). We thus hypothesize that firms with more trustworthy-looking CEOs generate both a higher quantity and quality of innovation through investment in riskier projects and greater efficiency in converting R&D input into patent output.

To measure CEO trustworthiness, we collect the LinkedIn profile photos of the CEOs of publicly listed firms and quantify the perceived trustworthiness of these CEOs using the AI-based facial analysis procedure of Vernon et al. (2014). This automated procedure has been validated by its high correlation with human-rated trustworthiness (Vernon et al. 2014; Peng et al. 2022). We also construct a comprehensive set of CEO and firm characteristics to control for potential confounding factors in the relation between trustworthiness and innovation.

Before analyzing innovation, we examine whether the facial trust measure exhibits empirical patterns consistent with a credible proxy for perceived trust. We do so by testing its relation with analyst behavior and stakeholder responses, namely employee assessments and institutional voting, which theory predicts should be sensitive to managerial trustworthiness

[3] For example, people who appear more trustworthy are less likely to receive extreme criminal-sentencing outcomes (Wilson and Rule 2015) and are more likely to receive favorable loan arrangements (Duarte, Siegel, and Young 2012) and have favorable labor market outcomes (Linke, Saribay, and Kleisner 2016; Guenzel et al. 2025). In capital markets, existing evidence suggests that perceived trustworthiness – based upon facial appearance and other behavior traits – shapes investor beliefs and decision-making (e.g., Hsieh et al. 2020; Agarwal, Lu, and Ray 2021; Peng et al. 2022; Agarwal, Arısoy, and Trinh 2025).

We find that analysts update earnings forecasts more quickly following earnings conference calls for firms whose CEOs are perceived as more trustworthy. Turning to employees, CEO trustworthiness is positively associated with greater employee satisfaction in Glassdoor, as evidenced by higher ratings for the firm overall, senior leadership, and business outlook. Consistent with these findings, firm's led by more trustworthy-looking CEOS are more likely to appear on *Fortune* "100 Best Companies to Work For", an alternative proxy for employee satisfaction (Edmans 2012).

We then examine institutional shareholders. Trustworthy CEOs receive greater support in shareholder proxy votes in favor of their proposals. CEO perceived trustworthiness is also positively associated with financing inflows, measured using net financing cash flows and debt issuance scaled by total equity, indicating more funding from investors in support of innovation. Finally, trustworthy-looking CEOs are less likely to be terminated after poor performance, a pattern not observed for less trustworthy-looking CEOs. This result is especially relevant for innovation, where projects often entail high risks of short-term failures before any long-run success is realized.

Taken together, these findings validate the facial trust measure and motivate our investigation of the relation between perceived CEO trustworthiness and the quantity and quality of patent output. In panel regression tests, we find that CEO perceived trustworthiness is positively related to firm-level patent output measured by the number of newly filed patents and measures of patent quality, including citation count, estimated dollar value, and technological novelty, scope, and originality.

Moreover, we propose and test two pathways by which CEO perceived trustworthiness can improve innovation performance: project riskiness and innovation efficiency. As discussed earlier, greater trust from shareholders and analysts allows trustworthy CEOs to invest in promising yet riskier projects. Furthermore, trusted CEOs receive more support from employees, which should improve efficiency in general, including innovation activities. Using proxies of the standard deviation of forward citations and the ratio of patent output to R&D investment, our evidence supports both mechanisms.

A possible endogeneity issue is that community characteristics may influence both innovation opportunities and the hiring of managers with certain facial traits. It is not obvious why hiring would be done in a way that induces a positive association between the two. Nevertheless, to address causality, we exploit quasi-exogenous shocks in the form of financial scandals involving firms based nearby that are neither customers nor suppliers of the focal firm. Such local trust crises heighten the salience of CEO trustworthiness to stakeholders. We hypothesize that in such circumstances, it is especially important for a CEO to be trusted to innovate effectively, increasing the sensitivity of focal firm patents to managerial facial traits. Crucially, there is no obvious reason why there should be a direct effect from the scandal of an unrelated firm to this sensitivity.

To test this hypothesis, we perform a stacked difference-in-differences-in-differences test of how the sensitivity of patents to facial traits differs before and after scandals. In the pre-event period, we do not find different trends between treated and control firms, which is consistent with the two groups not having fundamental pre-existing differences. We find that the association between CEO perceived trustworthiness and corporate innovation is stronger for treated firms relative to control firms following local trust crises. The effects of omitted variables and confounding factors are likely mitigated in this test that includes region-year joint fixed effects and which focuses on the *change* in the trustworthiness-innovation relation before and after fraudulent events.[4]

To address robustness, we conduct a battery of additional tests. Our results remain robust to controlling for inherited trust of CEOs (a cultural measure of the propensity to trust others; Nguyen 2025), using an alternative measure for CEO trustworthiness, using alternative model specifications, using alternative measures of innovation outcomes, controlling for additional characteristics of CEOs, and focusing on specific subsamples. Details of these robustness checks are discussed in Section 3.4.

We next explore the incentives for trusted CEOs to promote innovation and effects on analyst beliefs. We have argued that when stakeholders trust the commitments of CEOs more, stakeholders are more willing to contribute to innovative activities. Consistent with this, we find that the sensitivity of patent output to employee stock options increases with CEO perceived trustworthiness. This indicates that trust encourages greater employee effort by strengthening their belief that management will reward their contributions. Also consistent with this, we find that the

[4] For an omitted variable to explain the difference-in-differences-in-differences result, its change has to affect or correlate with fraud by local peers, patent output of focal firms, and trustworthiness in a specific way. There is no obvious reason why local cultural or economic characteristics would explain our results.

relation between short-term institutional ownership and R&D investment when the CEOs are more trusted. Furthermore, we find a negative relation between perceived CEO trustworthiness and analyst forecast dispersion. This is consistent with trust reducing perceived information asymmetry, so that analysts place more weight on CEO public disclosures and therefore end up disagreeing less. These results highlight that CEO trustworthiness enhances corporate innovation through both internal motivation and external support. The consistency of these findings also lends further supports for a causal interpretation of the baseline result.

Finally, to understand when CEO trustworthiness matters most, we consider two factors that shape a CEO's relationship with stakeholders: appointment type and tenure. We find that the sensitivity of innovation measures to CEO trustworthiness is greater for externally appointed CEOs and for those with shorter tenure. These findings are consistent with the idea that facial cues are especially important in new social interactions, where stakeholders have limited prior information about the CEO.

This research makes three main contributions. First, most existing research on the role of social trust in economic growth examines trust at the country or regional level.[5] In contrast, we offer individual- and firm-level evidence about innovation outcomes. Our research complements Nguyen (2025), who studies the effect of a CEO's trust towards others on firm innovation outcomes. In contrast, we study trust in the opposite direction: how external stakeholders perceive the propensity of CEOs to carry through on commitments to stakeholders and to deliver promised innovation outcomes. Our study also examines the underlying channels via employees, institutional investors, and stock analysts.

Second, this study contributes to the growing literature on the role of CEOs in corporate innovation. Existing work highlights the importance of observable attributes such as compensation

[5] For related studies, see, e.g., Knack and Keefer (1997), Zak and Knack (2001), Barro and McCleary (2003), Beugelsdijk, de Groot, and van Schaik (2004), Guiso, Sapienza, and Zingales (2006), Xie, Zhang, and Zhang (2022), Eesley and Lee (2023). Our focus is on facial impressions and differs from existing studies infer corporate trust from textual disclosures and often use a corporate culture-based explanation (e.g., Larcker and Zakolyukina 2012; Audi, Loughran, and McDonald 2016; Hope and Wang 2018; Breuer, Knetsch, and Salzmann 2020; Cho, Krishnan, and Cho 2023).

structure and education/professional background,[6] attitudes shaped by early experiences,[7] and overconfidence. Hirshleifer, Low, and Teoh (2009) find that CEO overconfidence promotes innovation by encouraging risk-taking. In contrast, we focus on perceived trustworthiness, a personal trait that shapes how stakeholders evaluate managerial credibility and commitment to risky long-horizon projects. By emphasizing perceptions of credibility, our study complements research on executive incentives and backgrounds and expands the set of personal attributes influencing innovative performance.[8]

Finally, this study builds on the literature on CEO profiles in corporate governance. Prior studies often rely on indirect observable proxies of executive background, such as political connections (Fan, Wong, and Zhang 2007), cultural backgrounds (Liu 2016), and professional training (Heese, Pérez-Cavazos, and Peter 2023), which may contain multifaceted information about CEOs. This paper differs in studying how perceived trustworthiness, proxied by facial traits, affects innovation outcomes. From a broader perspective, we contribute to the application of AI to capture a specific dimension of CEO profiles that has real effects on corporate performance.[9]

The remainder of the paper is organized as follows. Section 2 discusses the data, sample formation, and tests of the relationship between our perceived trustworthiness measures and analyst and stakeholder behaviors. Section 3 presents the main empirical results, mechanism tests, robustness checks, and identification tests. Section 4 reports tests for stakeholder incentives and analyst beliefs, and Section 5 presents heterogeneous effects. Section 6 concludes.

[6] Balkin, Markman, and Gomez-Mejia (2000) and Mao and Zhang (2018) focus on short-term salary and long-term equity-based compensation of CEOs, and Barker and Mueller (2002) focus on CEO characteristics, such as tenure, age, stock holdings, education, and experience,

[7] Yi, Chu, and Png (2022) show that people experienced early-life hardship are subsequently more likely to become entrepreneurs. In addition, Bernile, Bhagwat, and Rau (2017) show that CEOs with early-life exposure to disasters tend to adopt more aggressive strategies in corporate expansion.

[8] Jia, van Lent, and Zeng (2014) examine the effect of the facial width-to-height ratio (*FWHR*) of CEOs, a proxy for testosterone-related risk-taking. See Todorov (2019) for concerns about the *FWHR* measure. Blankespoor, Hendricks, and Miller (2017) use human-rated CEO perceptions (the average of perceived competence, trustworthiness, and attractiveness) and find a positive association with IPO pricing.

[9] Sheng et al. (2024) study the use of AI in hedge fund investment styles. Jha et al. (2024) use AI to extract managers' expectation about their economic outlook.

2. Data and Sample

2.1 CEO's Perceived Trustworthiness

To measure a CEO's perceived trustworthiness, we first manually collect CEO LinkedIn profiles using the full list of CEO names from the ExecuComp database. Our research assistants manually search for their LinkedIn profile photos. We use LinkedIn profile photos because they are publicly available, professional in appearance, uniform in settings across individuals,[10] and very likely approved by the CEOs to project a specific image to the external world.[11] To ensure matching accuracy, we require that the individual's LinkedIn name, firm, and job title all align with the corresponding information in ExecuComp.[12] In total, we identified 3,017 LinkedIn profiles, with 1,911 having profile photos.[13] Figure 1 plots the sample coverage over time. On average, 39.5% of CEOs in the ExecuComp database are registered on LinkedIn, and 52.1% of these have profile photos.[14]

---

[10] Contextual factors may influence the interpretation of a face (e.g., a face in a business suit against an office backdrop versus the same face in casual attire at a beach), so, a uniform setting helps remove context-related factors (see, e.g., Oosterhof and Todorov (2008)).

[11] LinkedIn advises users to upload a current photo that accurately reflects their appearance. They have offered guidelines for profile pictures, such as using a high-resolution image, selecting an expression that conveys professionalism, and opting for soft, natural lighting. For related discussion, see https://business.linkedin.com/talent-solutions/blog/2014/12/5-tips-for-picking-the-right-linkedin-profile-picture.

[12] Specifically, we apply the following criteria: (i) the first and last name of the individual on LinkedIn needs to match the CEO name in ExecuComp, (ii) the working experience of the individual on LinkedIn needs to match the working experience of CEOs in ExecuComp, and (iii) the job title of the individual on LinkedIn needs to include at least one of the following terms: "CEO," "chief executive officer," "board," "chief manager," "chairman," "president," "principal," "director," or "chairperson."

[13] Two possibilities for the missing profile photos are: (i) the CEO has not uploaded a profile photo, and (ii) the privacy settings restrict public access to their profile photos (e.g., only visible to first-degree or second-degree connections).

[14] The ratio of CEOs registered on LinkedIn has been increasing before 2010 and becomes relatively stable at 50% after 2010. The ratio of CEOs who have registered on LinkedIn have publicly visible profile photos has gradually increased over time, from 40% in the 1990s to 50% in the 2000s, and then to 60% in the 2010s and 2020s.

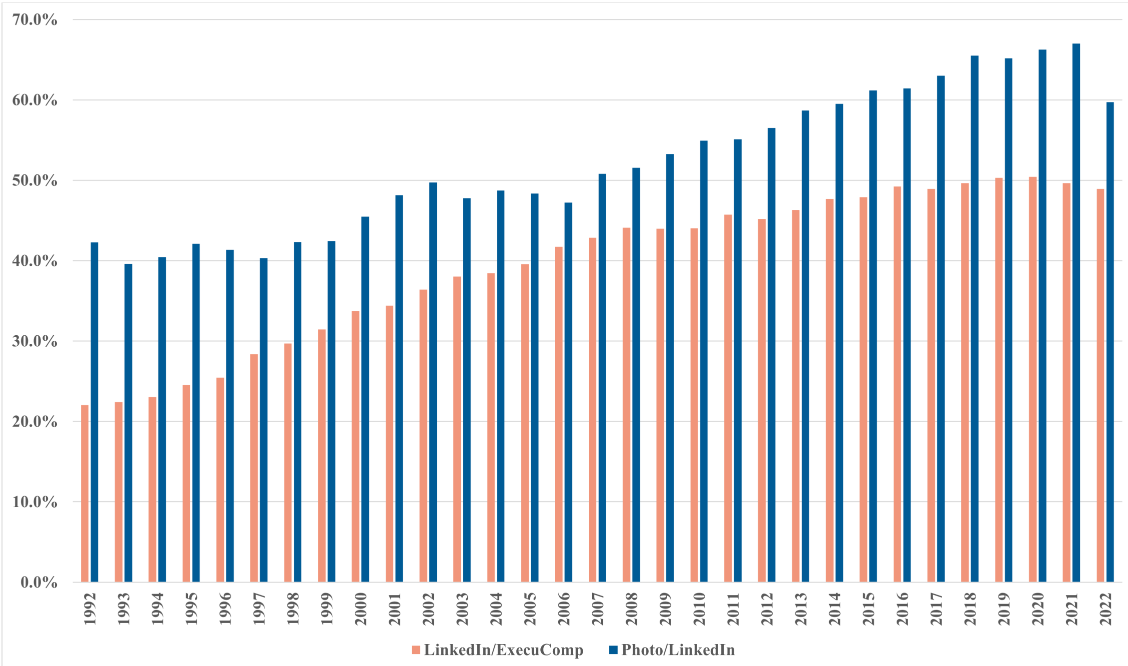

Figure 1. Sample Coverage

This figure plots the sample coverage ratio over time. The pink bars plot the fraction of CEOs who have registered on LinkedIn relative to CEOs in the ExecuComp dataset. The blue bars plot the fraction of LinkedIn CEOs with profile photos. The sample period is from 1992 to 2022.

Next, we compute the trustworthiness score for each photo following prior studies (Vernon et al. 2014; Peng et al. 2022). Specifically, we use the iBUG facial landmark detection tool to identify 68 key fiducial points on each CEO photo (Sagonas et al. 2016). An example of an annotated profile photo is shown in Online Appendix Figure OA1. We then compute 65 facial attributes using the coordinates of key fiducial points. The perceived trustworthiness is calculated as a combination of these facial attributes using the weights in Vernon et al. (2014).[15] Figure 2 visualizes this process, with additional technical details provided in Online Appendix 1. To provide an intuitive understanding of the measure, we illustrate in Figure 3 the average faces of different levels of perceived trustworthiness using our collected CEO photos.

[15] A complete list of 65 facial attributes is provided in Online Appendix Table OA1.

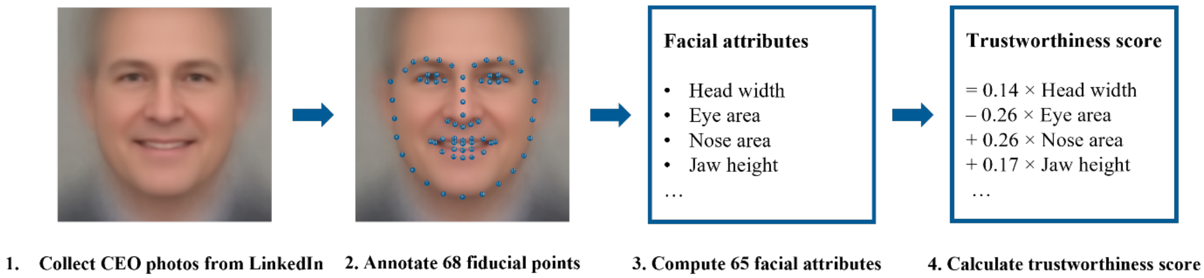

Figure 2. The Procedure of Measuring CEO Perceived Trustworthiness

In this figure, we illustrate the procedure for measuring CEO trustworthiness. In step 1, we collect CEO photos from LinkedIn. In step 2, we extract the face from each photo and delineate its 68 fiducial points using the iBUG tool. In step 3, we compute the 65 facial attributes based on the annotated points. In step 4, we compute the trustworthiness score for each CEO by linearly combining the facial attributes using the weights in Vernon et al. (2014).

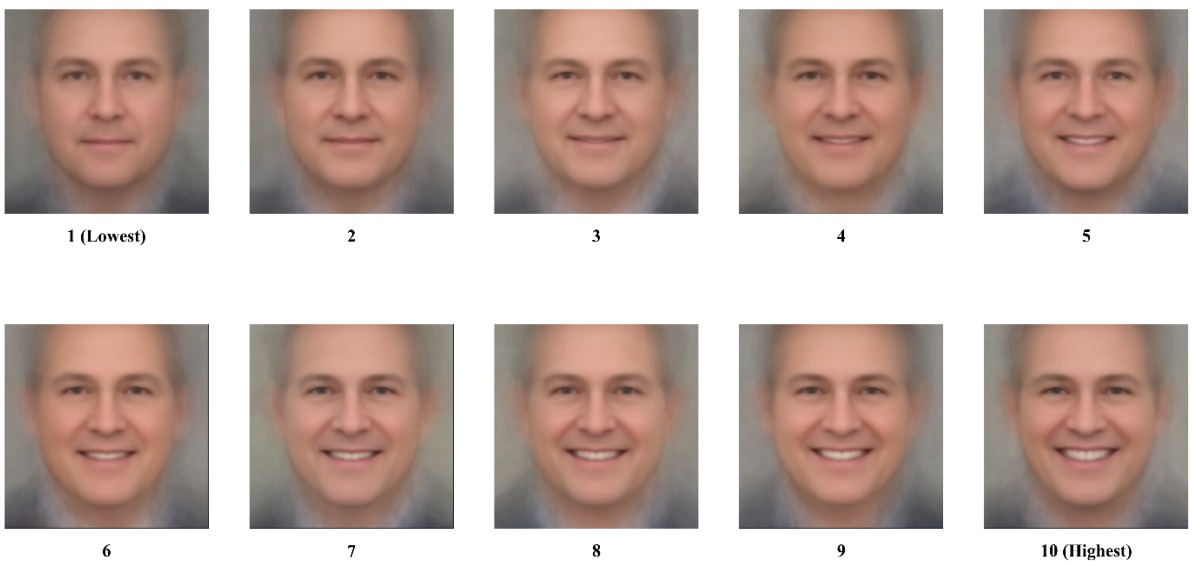

Figure 3. The Average Face by CEO Perceived Trustworthiness

In this figure, we illustrate the average face for each decile of CEO trustworthiness (1 = lowest and 10 = highest). The average face is generated using the Delaunay triangulation warping method.

This automated procedure has been validated using human-rated scores of trustworthiness in prior psychology and economics studies (Vernon et al. 2014; Peng et al. 2022).[16] The underlying rationale of this approach draws on evolutionary psychology: Over millions of years, humans developed an instinctive ability to assess the trustworthiness of others within a split second — a

[16] For example, Vernon et al. (2014) compare the automated and human rated trustworthiness scores for synthesized face-like images and find their correlation is 0.93. Using MTurk human raters, Peng et al. (2022) find that, in the setting of stock analysts, the correlation between automated and human rated trustworthiness scores is 0.92.

trait crucial for selecting reliable collaborators and social partners. This instinct is largely driven by facial features and their configurations, which convey social cues that the human brain is attuned to interpret (Todorov 2017).

The algorithm's outputs have been shown to be robust to pre-existing characteristics. In particular, it has very low correlation with age (Sutherland et al. 2013), likely because the judgment of trustworthiness relies on the relatively stable developing structural configuration of the face (such as bone structure and long-term muscle, Todorov 2017).[17] Importantly, the algorithm evaluates only facial landmarks and does not use features such as hair. Accessories and grooming attributes (such as glasses, beards, and mustaches) do not load on perceived trustworthiness (see Vernon et al. 2014).

To evaluate the representativeness of LinkedIn profile photos, we compare the perceived trustworthiness scores with those from a random sample of 100 official CEO photos obtained from firms' proxy statements.[18] The correlation is high (ρ = 78.5%), indicating that LinkedIn photos provide a reliable measure of perceived trustworthiness.

To address whether the perceived trustworthiness score, *CEO TRUST*, reflects information captured by existing CEO characteristics. We also construct $CEO\ TRUST_{RESIDUAL}$, which is the residual from regressing *CEO TRUST* on all CEO characteristics, including age, gender, tenure, education, and compensation (salary, bonus, equity holding, options, and sensitivity to stock price changes and volatility) as those characteristics are related to innovation performance (Barker and Mueller 2002; Mao and Zhang 2018; Guzman and Kacperczyk 2019). All these variables are defined in detail in Appendix 1. This measure contains only new information from perceived CEO trustworthiness.

2.2 Corporate Innovation Performance

To measure corporate innovation performance, we use patent data from two sources: the Kogan et al. (2017) patent database and PatentsView.org. The former provides firm-level

---

[17] Sutherland et al. (2013) use principal components analysis and find that, unlike other facial impressions (such as dominance and attractiveness), trustworthiness has low and unsubstantial loading over age (ρ = 0.04, as shown in their Table 1, page 111). In our sample, the correlation between CEO trustworthiness and age is also very low (ρ = 0.00, as shown in Table 3, Panel B).

[18] For several reasons, we do not use proxy statements as the main source of CEO photos: (i) many proxy statements do not include CEO photos, (ii) photos in proxy statements are often low-resolution, in non-jpeg format, or presented in grayscale, and (iii) these photos frequently contain embedded captions or feature multiple individuals.

innovation metrics such as the number of patents and citations, as well as the real and nominal dollar value of each patent. To construct additional measures for innovation quality, we link patent citation data from PatentsView.org to public firms using the link provided by Kogan et al. (2017) and compute each patent's novelty, scope, and originality following past studies on innovation (Trajtenberg, Henderson, and Jaffe 1997; Seru 2014; Dong, Hirshleifer, and Teoh 2021; Tian, Yan, and Zuo 2025).[19] Appendix 1 provides a list of detailed definitions of all innovation variables used in this study.

2.3 Sample Construction and Summary Statistics

To construct the sample, we begin with the 1,911 hand-collected CEO photos from LinkedIn. We match them to the ExecuComp database, which yields 16,768 firm-year observations. We then apply the following sample screens (Table 1 outlines the full sample selection procedure).

First, we obtain data to construct control variables. We obtain firm fundamental data from Compustat, CRSP, and Thomson Reuters Institutional Holdings (13F) databases. This step excludes 3,968 observations due to missing firm-level data. We collect CEO characteristics from ExecuComp, CRSP, and the CEO incentive database, excluding an additional 619 observations due to missing data. We also require non-missing corporate innovation variables for year $t + 1$, which excludes 1,534 observations. In our regression analyses, we include firm fixed effects to account for time-invariant, firm-specific confounders. This specification requires within-firm variation in patent output and therefore excludes 93 singleton observations from the regression analyses.

Our final dataset comprises a firm-year panel of 10,554 firm-year observations for 1,163 firms from 1992 to 2022 that includes CEO perceived trustworthiness, innovation outcomes, and the full set of control variables. As shown in Online Appendix Table OA2, firms included in our LinkedIn-photo sample exhibit similar fundamentals and CEO characteristics to those in the broader Compustat universe, confirming the representativeness of our sample. The fact that our

[19] Innovative novelty is the average of the class- and year-adjusted citations per patent that the firm received over time. Greater novelty indicates that a firm's patents represent more substantive innovations. Innovative scope is the dispersion of technology classes among future citations. Greater scope (sometimes called "generality") indicates that a firm's patents are subsequently applied across a wider range of technological domains. Innovative originality is the average dispersion of technology classes of previous patents that the firm's patents cite. Great originality indicates that a firm's patents draw upon knowledge from a wider range of technological areas, deviating from existing technological trajectories.

sample is reasonably similar to the Compustat universe also suggests that our results are more generalizable to all publicly listed firms.

Table 2 summarizes the distribution of our sample. The number of observations per year increases from 30 in 1992 to 510 in 2015, followed by a stable trend of around 500 in recent years. The three most represented industries are business services (two-digit SIC 73, 12.4%), chemical and allied products (two-digit SIC 28, 8.2%), and electronic and other electric equipment (two-digit SIC 36, 7.4%). These three industries cover a substantial share of innovative firms (including Microsoft, Google/Alphabet, General Electric, Johnson & Johnson, etc.) and are also among the most represented industries in the broader Compustat universe.[20]

Table 3, Panel A presents descriptive statistics of key variables. On average, CEO perceived trustworthiness has a mean of 0.078 and a standard deviation of 0.476. An average firm has a book value of $2.12 billion, files 17 patents per year, and receives 205 forward citations. Crucially, the Pearson correlations shown in Table 3, Panel B suggest that (i) CEO perceived trustworthiness, *CEO TRUST*, is positively correlated with the number of patents and forward citations in the following year, and (ii) *CEO TRUST* has low correlations (with none exceeding 10%) with firm fundamentals and CEO characteristics. These patterns provide preliminary evidence that CEO perceived trustworthiness is distinct from other possible determinants of corporate innovation.

2.4 Research Design

To examine the relation between CEO perceived trustworthiness and outcome variables, we estimate the following ordinary least squares regression model:

$$Outcome_{i,t\ or\ t+1} = \beta \cdot CEO\ TRUST_{i,t}\ or\ CEO\ TRUST_{RESIDUAL\ i,t} + Controls_{i,t} + \gamma_i + \tau_t + \varepsilon_{i,t}\ , \quad (1)$$

where *Outcome* denotes one of several outcome variables of firm *i* in year *t* (for variables in the analyst and stakeholder behavior tests) or *t* + 1 (for innovation-related variables). The key explanatory variable, *CEO TRUST*, is the facial trustworthiness score of the CEO hired by firm *i* in year *t*. We also consider $CEO\ TRUST_{RESIDUAL}$, which is the residual from regressing *CEO TRUST* on all CEO characteristics. Both variables have been defined in Section 2.1. *Controls*

[20] In the broader Compustat universe, business services (two-digit SIC 73), chemical and allied products (two-digit SIC 28), and electronic and other electric equipment (two-digit SIC 36) represent 9.65%, 9.35%, and 5.97% of all observations, respectively.

denotes a vector that includes an extensive list of firm fundamentals and CEO characteristics.[21] Detailed definitions of these control variables are provided in Appendix 1. In addition, we include firm fixed effects (γ_i) to account for time-invariant, firm-specific innovation styles and year fixed effects (τ_t) to account for time-varying market-wide trends. In a robustness check, we further control for year times firm-headquarters-region fixed effects to absorb all local business or culture factors. The statistical inferences are based on standard errors clustered by firm to accommodate estimation errors related to firms.

2.5 Evaluation of the Perceived Trustworthiness Measure

In this section, we evaluate our CEO perceived trustworthiness measure using various data related to the trust of key stakeholders, including employees, shareholders, and financial analysts.

2.5.1 CEO Perceived Trustworthiness and Employee Trust

To test whether CEO perceived trustworthiness motivates greater effort from employees in the belief that management will reward their efforts, we estimate Equation (1) using employee satisfaction ratings on Glassdoor as the dependent variable. We consider both overall ratings for the firm and ratings for the senior leadership and business outlook.[22] We find consistent evidence that CEO perceived trustworthiness is positively and significantly associated with employee satisfaction on Glassdoor. As shown in columns (1)-(3) of Table 4, Panel A, a one-standard-deviation increase in *CEO TRUST* is associated with a 6.3% (= 0.476 × 0.133 × 100%) increase in employees' overall rating of their firm, a 6.0% (= 0.476 × 0.126 × 100%) increase in their rating

---

[21] The firm-level control variables include: *SIZE*, measured as the natural logarithm of book assets; *RD*, measured as R&D expenses scaled by book assets; *FIRM AGE*, measured as the natural logarithm of one plus the number of years that a firm is listed on Compustat; *ROA*, measured as the operating income before depreciation divided by the book assets; *PPE*, measured as the net PP&E scaled by book assets; *LEVERAGE*, measured as book debt scaled by book assets; *CAPEX*, measured as capital expenditures scaled by book assets; *TOBIN Q*, measured as the sum of the market equity and book debt to the sum of the book equity and book debt; *KZ INDEX*, measured the Kaplan-Zingales index of financial constraints; *HHI* and *HHI SQUARED*, measured as the squared Herfindahl index and its square, based on revenue concentration within the firm's four-digit SIC industry; *INSTITUTION*, measured as the fraction of shares held by institutional investors; *ILLIQUIDITY*, measured as stock illiquidity measure following Amihud (2002). The CEO-level controls include: *FEMALE*, measured as an indicator variable equal to one if a CEO is female and zero otherwise; *AGE*, measured as the CEO's age; *TENURE*, measured as the CEO's tenure in years; *EDU*, measured as the CEO's education level; *SALARY*, measured as the CEO's annual salary; *BONUS*, measured as the CEO's annual bonus; *EQUITY HOLDINGS*, measured as the CEO's total equity holdings; *NEW OPTION PPS*, measured as the price volatility of the CEO's newly granted options; *NEW STOCK PPS*, measured as the price volatility of the CEO's newly granted stocks; *DELTA*, measured as the sensitivity of the CEO's total wealth to stock price; *VEGA*, measured as the sensitivity of the CEO's total wealth to stock volatility.

[22] The employee satisfaction is computed as the average of all employee ratings for a firm in a year. To construct a robust measure of employee satisfaction, we require each firm to have at least 10 reviews in a year.

of senior leadership, and a 5.3% (= 0.476 × 0.111 × 100%) increase in their rating of the firm's business outlook.[23]

We further test whether facial trust is associated with the inclusion of firms in *Fortune* magazine's "100 Best Companies to Work For" list, a widely recognized indicator of employee satisfaction (Edmans 2012). As shown in column (4) of Table 4, Panel A, a one-standard-deviation increase in *CEO TRUST* corresponds to a 12.3% (= [0.476 × 0.007] / 0.027 × 100%) higher likelihood of being included in the list compared with the sample average.[24] This result reinforces the idea that a trustworthy CEO appearance is associated with a more positive workplace environment, which, in turn, supports higher levels of employee engagement. In columns (5)-(8), we repeat the regressions by replacing *CEO TRUST* with $CEO\ TRUST_{RESIDUAL}$ and obtain similar results. All these results collectively support the conclusion that employee trust increases with CEO perceived trustworthiness. The full regression results showing the estimated coefficients for control variables are tabulated in Online Appendix Table OA3.

2.5.2 CEO Perceived Trustworthiness and Shareholder Trust

We hypothesize that the perceived trustworthiness of a CEO increases shareholder confidence in the firm's R&D and innovation investments, making it more likely that investors will back such initiatives. To test this, we replace the dependent variable in Equation (1) with several proxies for shareholders' trust. We first examine shareholder voting outcomes using data from ISS ESG Voting Analytics. Consistent with our expectations, we find that trustworthy CEOs receive greater support for their proposed agendas. As shown in columns (1) and (2) of Table 4, Panel B, a one-standard-deviation increase in *CEO TRUST* is associated with a 0.8% (= 0.476 × 0.016 × 100%) increase in the percentage of "for" votes and a corresponding 0.8% (= 0.476 × – 0.017 × 100%) decrease in the percentage of "against" votes. CEO perceived trustworthiness is not significantly associated with the percentage of "abstain" votes (untabulated).

---

[23] CEO perceived trustworthiness is also positively and significantly associated with employee ratings in other dimensions, such as career opportunities, compensation and benefits, and work-life balance (untabulated).

[24] We gratefully thank Long Yi for sharing the "100 Best Companies to Work For" data (Hsu, Lee, and Yi 2024). In this test, we do not use firm fixed effects, as more than 95% of firms are never included, leaving little variation after their inclusion. In an untabulated analysis focusing on the firms included in the list with firm fixed effects, a one-standard-deviation increase in *CEO TRUST* corresponds to about a 40-position improvement.

We further find that firms led by trustworthy CEOs secure more financing. As reported in columns (3) and (4) of Table 4, Panel B, a one-standard-deviation increase in *CEO TRUST* is associated with a 7.1% (= 0.476 × 0.149 × 100%) increase in financing cash flows and an 8.1% (= 0.476 × 0.170 × 100%) increase in debt issuance, suggesting that capital providers are more willing to fund the undertakings of trustworthy leaders.[25]

The literature on innovation emphasizes the value of tolerance for short-term failure (Holmstrom 1980; Manso 2011). So shareholder confidence in the CEO is especially valuable during periods of short-term failures. To examine this, we create an indicator variable for poor performance, *LOW ROA*, which equals one if a firm's ROA falls into the bottom quintile relative to contemporaneous two-digit SIC peers and zero otherwise. We also classify a CEO as low trustworthy-looking if their trustworthiness score falls into the bottom quintile relative to contemporaneous two-digit SIC peers.

We find that in the subsample of firms with low trustworthy-looking CEOs, poor performance increases the likelihood of CEO termination in the following year by 2.5 percentage points. In contrast, among the firms led by trustworthy-looking CEOs, poor performance does not significantly increase the likelihood of termination. The difference in coefficients on *LOW ROA* between the two subsamples is statistically significant. These results are presented in columns (5) and (6) of Table 4, Panel B. Again, in columns (7)-(12), we repeat the regressions by replacing *CEO TRUST* with $CEO\ TRUST_{RESIDUAL}$ and obtain similar inferences.

Overall, all results presented in this table support a positive relation between CEO perceived trustworthiness and shareholders' trust. The full regression results showing the estimated coefficients for control variables are tabulated in Online Appendix Table OA4.

2.5.3 CEO Perceived Trustworthiness and Financial Analysts' Trust

We next examine whether the perception of CEO trustworthiness is related to the behavior of financial analysts, who play a vital role in interpreting and communicating the potential of firms

[25] The cash flow of financing activities is calculated as debt issuance (Δat – Δceq – Δtxdb) plus sales of stocks (sstk – prstkc) minus the issuance of dividends (dvc + dvp), scaled by the average of current and lagged total equity. The debt issuance is calculated as the change in assets minus the change in book equity [Δtotal assets (at) – Δbook equity (ceq) – Δ deferred taxes (txdb)], scaled by the average of current and lagged total equity.

to the market. We expect that when analysts trust the CEO, they can more effectively deliver their insights to the market, reinforcing trust among employees and shareholders.

To capture analyst trust, we construct a variable *FORECAST SPEED*, which represents analyst forecast speed of revision response to earnings conference calls. It is calculated as the reciprocal of the median number of days for analysts to revise their earnings forecasts after a firm's corporate earnings conference calls. Faster forecast revisions reflect analysts' stronger confidence in the veracity of information provided to them during earnings conference calls. This reduces the need for independent verification, enabling faster revision. Analyst forecasts are retrieved from the I/B/E/S database, and corporate earnings calls are collected from the Thomson ONE StreetEvents database.

We find that CEO perceived trustworthiness is associated with faster forecast revision. Economically, a one-standard-deviation increase in *CEO TRUST* is associated with a 5.3% (= $[0.476 \times 0.059] / 0.447 \times 100\%$) faster post-call earnings revision compared with the sample mean. These estimation results are tabulated in Table 4, Panel C. The full regression results showing the estimated coefficients for control variables are tabulated in Online Appendix Table OA5.

Overall, our analyst and stakeholder behavior tests indicate that CEO perceived trustworthiness is positively associated with the trust of key stakeholders of employees, shareholders, and financial analysts. They collectively support the validity of the use of a facial proxy for CEO perceived trustworthiness to capture stakeholder trust in CEOs.

3. Main Empirical Findings

3.1 CEO Perceived Trustworthiness and Innovation

We now examine the relation between perceived CEO trustworthiness and corporate innovation. To do so, we estimate Equation (1) using several measures for innovation output of firm i in year $t + 1$ as the dependent variable. In our baseline regressions, we use the number of patents and their forward citations. We define *Ln(PATENTS)* as the natural logarithm of one plus the number of patents a firm filed in year $t + 1$, and *Ln(FORWARD CITATIONS)* as the natural logarithm of one plus the number of forward citations received by a firm's patents in year $t + 1$. In robustness checks, we also consider the inverse hyperbolic sine of the number of patents in OLS regressions, and the raw number of patents in Poisson and negative binomial regressions.

Table 5 presents our main results. In Panel A, columns (1)-(3) show estimates of Equation (1) under several model specifications. Column (1) includes only the key explanatory variable, *CEO TRUST*. Column (2) adds firm-level control variables to account for firm fundamentals. Column (3) further incorporates CEO-level control variables to address heterogeneity in CEO characteristics.

In all specifications, the estimated coefficients of our main interest, *CEO TRUST*, are positive, economically meaningful, and highly statistically significant, regardless of the inclusion of control variables. In the fully controlled specification of column (3), a one-standard-deviation greater value of *CEO TRUST* is associated with 11.7% (= 0.476 × 0.246 × 100%) more patents filed in the subsequent year, which corresponds to about 2.0 (= 11.7% × 17.003) more patents per year.[26]

Columns (4)-(6) repeat the analysis by replacing the dependent variable with *Ln(FORWARD CITATIONS)* as defined above. The estimated coefficients of *CEO TRUST* remain positive and highly significant. In the full specification in column (6), a one-standard-deviation greater value of *CEO TRUST* is associated with 25.9% (= 0.476 × 0.545 × 100%) more forward citations received by the patents filed in the subsequent year, which corresponds to about 53.1 (= 25.9% × 204.684) more forward citations per year.

We also test whether CEO perceived trustworthiness is associated with widely used measures of innovation quality. These include the number of forward citations per patent, economic value, novelty, scope, and originality per patent (Trajtenberg et al. 1997; Seru 2014; Kogan et al. 2017; Dong et al. 2021; Tian et al. 2025). We use them as dependent variables for Equation (1) and present the estimation results in Panel B. The estimated coefficients of *CEO TRUST* are all positive and statistically significant. For each patent, a one-standard-deviation greater in *CEO TRUST* corresponds to 11.8% (= 0.476 × 0.248 × 100%) more forward citations, 37.0% (= 0.476 × 0.777 × 100%) greater real patent value, and 38.3% (= 0.476 × 0.805 × 100%) greater nominal patent value. Additionally, it is associated with 3.6% (= 0.476 × 0.076 × 100%), 1.0% (= 0.476 × 0.020 × 100%), and 1.6% (= 0.476 × 0.034 × 100%) greater patent novelty, scope, and originality, respectively.

---

[26] This economic magnitude is also comparable to other determinants of corporate innovation documented in previous studies. For instance, in Hirshleifer et al. (2012), an indicator of confident CEO (measured using their granted options) is associated with 9.3% to 11.1% more patents, as shown in their Table V columns (1)-(3) on page 1474.

In Panel C, we re-estimate the regressions from Panels A and B using *CEO TRUST*$_{RESIDUAL}$ in place of *CEO TRUST* and obtain similar inferences. The full regression results showing the estimated coefficients for control variables are tabulated in Online Appendix Table OA6. Overall, these findings not only validate our baseline results but also indicate that CEO perceived trustworthiness is positively related to patent output in different dimensions.

3.2 Identification of Causality

A possible source of endogeneity is that local culture and business prospects are correlated with both innovation and with the choice of firms to hire CEOs with certain facial traits. This could induce a non-causal relation between facial traits and innovation. Although it is not obvious why this would occur, we address this possibility in two ways. First, we additionally control for region-year joint fixed effects to rule out local factors. Second, we use a difference-in-differences-in-differences design that focuses on the *change* in the trustworthiness-innovation relation before and after fraud detection.

Specifically, we perform a stacked difference-in-differences-in-differences test based on local trust crises in the form of financial scandals involving local peers operating in businesses that are not customers or suppliers to the focal firm. We hypothesize that such a scandal increases the importance of the perceived trustworthiness of CEOs to stakeholders. Furthermore, there is no obvious reason why there would be any direct effect of a scandal of an unrelated firm on the *sensitivity* of focal firm patents to facial traits.

We obtain information about corporate financial scandals using the Accounting and Auditing Enforcement Releases (AAER) database (Dechow et al. 2011). We exploit the staggered timing of different scandals to create cohorts of treated and control firms, examining each scandal across a seven-year window from years -3 to +3, including the announcement year 0. A firm is identified as treated if the following three conditions are satisfied. First, it does not have a scandal itself. Second, its headquarters are located in the same Core-based Statistical Area (CBSA) as another firm involved in a financial scandal. Third, it is not a customer or a supplier of the firm involved in a financial scandal.[27] These conditions ensure the shock captures only local credibility crises. A firm is identified as a control firm if its headquarters are located in a CBSA with no financial

[27] Specifically, we use ZIP-CBSA crosswalk from the U.S. Department of Housing and Urban Development to identify the CBSA code of each firm's headquarters; we use FactSet Revere to identify a firm's customer-supplier relationship.

scandal throughout the sample (i.e., never-treated). We then stack all cohorts, which gives us a balanced window for each cohort firm, and estimate a difference-in-differences-in-differences design (Baker, Larcker, and Wang 2022; Barrios 2024) as follows:

$$INNOVATION_{c,i,t+1} = \beta_1 \cdot CEO\ TRUST_{c,i,t} \times TREAT_{c,i} \times POST_{c,t} + \beta_2 \cdot CEO\ TRUST_{c,i,t} \times POST_{c,t} + \beta_3 \cdot CEO\ TRUST_{c,i,t} \times TREAT_{c,i} + \beta_4 \cdot CEO\ TRUST_{c,i,t} + Controls_{c,i,t} + \gamma_{c,i} + \tau_{c,k,t} + \varepsilon_{c,i,t}\ , \quad (2)$$

in which *c* indexes cohort (event), *i* indexes firm, *k* indexes the CBSA of the headquarters of firm *i*, and *t* indexes year. *INNOVATION* denotes the logged number of patents or forward citations, as defined earlier, of cohort *c*'s firm *i* in year *t* + 1. Because firms may be linked to multiple cohorts, a firm-year can appear in multiple cohorts. *POST* is an indicator for fraudulent event years and onward of a cohort, and *TREAT* is an indicator variable for treated firms in a cohort. The key test is given by the coefficient on the triple-interaction term, *CEO TRUST* × *TREAT* × *POST*. This tests whether CEO perceived trustworthiness has a stronger relationship with innovation after financial fraud by local peers.

For strongest identification, our estimation is cohort-specific, which includes cohort fixed effects interacted with all control variables ($Controls_{c,i,t}$), firm fixed effects ($\gamma_{c,i}$), and year times CBSA fixed effects ($\tau_{c,k,t}$). $\tau_{c,k,t}$ addresses possible explanations related to local cultural characteristics. The coefficient of interest, β_1, reflects the average treatment effects across all cohorts. The standalone terms of *TREAT*, *POST*, and *TREAT* × *POST* are subsumed by cohort-specific firm fixed effects and cohort-specific year times CBSA fixed effects.

Table 6 column (1) shows the results. The estimated coefficient for the triple interaction term, *CEO TRUST* × *TREAT* × *POST*, is significantly positive, supporting a causal effect of trust. This effect is economically meaningful: For treated firms, a one-standard-deviation greater *CEO TRUST* translates to about 10.1% (= 0.476 × 0.212 × 100%) greater patent output following a local peer financial scandal, which is approximately 3.6 (= 0.212 / 0.059, which is the estimated coefficient of standalone term *CEO TRUST*) times the overall trust effect. Also, *CEO TRUST* × *POST* is positive and significant, indicating that perceived trustworthiness becomes more important in general after the occurrence of local trust crises. In contrast, *CEO TRUST* × *TREAT* is not significant, so there is no indication that the importance of perceived trustworthiness differs between treated and control firms.

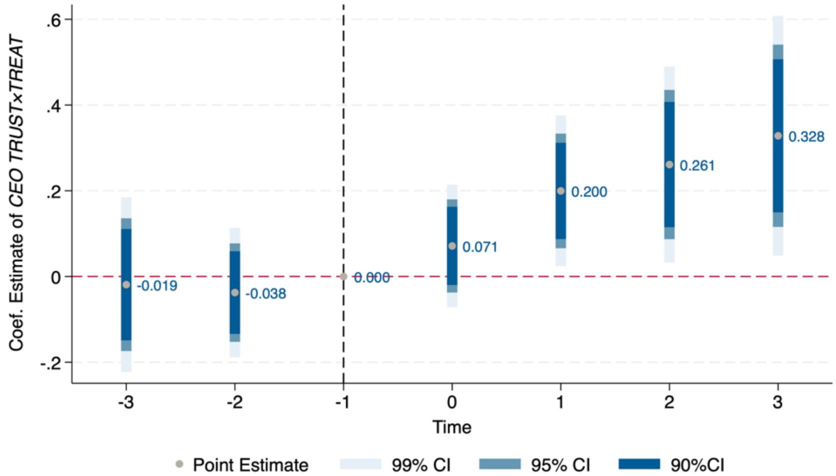

Figure 4(a). Number of Patents

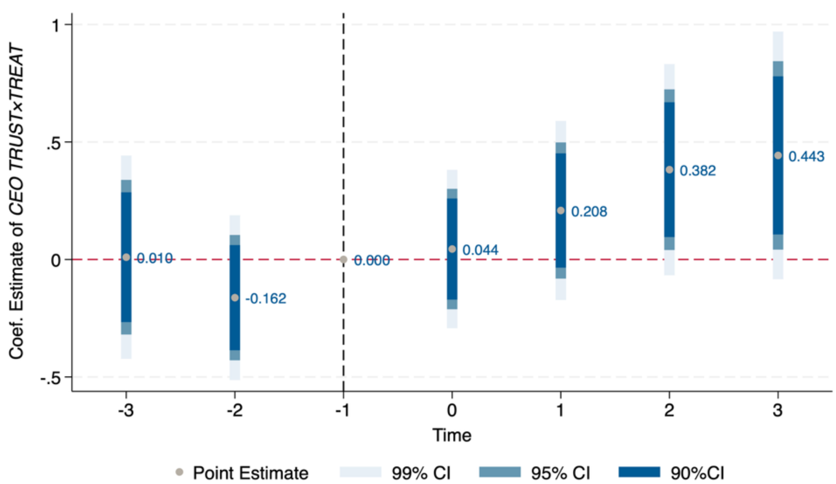

Figure 4(b). Number of Forward Citations

Figure 4. The Quasi-exogenous Shock of Corporate Financial Scandals

In this figure, we illustrate the regression results of Equation (2), showing the effects of the quasi-exogenous shock of corporate financial scandals on corporate innovation. In Figures 4(a) and 4(b), the dependent variables, *Ln(PATENTS)* and *Ln(FORWARD CITATIONS)*, are the natural logarithm of one plus the number of patents a firm filed and the natural logarithm of one plus the number of forward citations received by a firm's patents, respectively. The grey dots denote the coefficient estimates of the key independent variable, *CEO TRUST×TREAT×EVENT YEARS*, and the dark, medium, and light blue bars represent confidence intervals at 90%, 95%, and 99% levels, respectively. *EVENT YEARS* includes indicators of *PRE_3* (t = -3), *PRE_2* (t = -2), *POST_0* (t = 0), *POST_1* (t = 1), *POST_2* (t = 2), and *POST_3* (t = 3). For each event of corporate financial scandal, we create a cohort of treated and control firms around the event window of 7 years (i.e., -3 to 3, including the event year t = 0). A firm is identified as a treated firm if it (i) does not have a scandal itself, (ii) operates in the same Core-based Statistical Area (CBSA) as the firm involved in a financial scandal, and (iii) is not a supplier or customer of the firm involved in a financial scandal. A firm is identified as a control firm if it operates in a CBSA with no financial scandal throughout the sample (i.e., never treated). Treated firms are expected to have a comparable trust effect to the control firms before scandals but to experience an exogenous increase in the importance of trust afterward, leading to a more pronounced effect of *CEO TRUST* on corporate innovation. Corporate financial scandals are identified using the AAER dataset. All regressions include cohort-specific control variables, cohort-specific firm fixed effects, and cohort-specific year times CBSA fixed effects. The standard errors are estimated by clustering at the cohort-firm level. The year before the event (i.e., $t = -1$) is used as the baseline and is omitted because of multicollinearity. All variable definitions are provided in Appendix 1. The sample period is from 1992 to 2022.

We also conduct a dynamic test to evaluate the parallel-trend assumption. This addresses the possible concern that the treated and control firms have different trends in the pre-treatment periods regarding the importance of perceived CEO trustworthiness for innovation. In Table 6 column (2), we replace *POST* with a series of indicator variables for each year relative to the scandal (i.e., *PRE_3*, *PRE_2*, *POST_0*, *POST_1*, *POST_2*, *POST_3*). The year before the event (i.e., *PRE_1*) is used as the baseline, so its interactions (i.e., *CEO TRUST* × *TREAT* × *PRE_1*, *CEO TRUST* × *PRE_1*, and *TREAT* × *PRE_1*) are omitted because of multicollinearity. There are no significant differences in the years prior to the scandal, indicating the absence of differential pre-trends between treated and control firms. For a visual depiction, we plot the results of dynamic tests in Figure 4(a). The positive relation between CEO perceived trustworthiness and innovation becomes significantly larger for treated firms in the years following a scandal. This pattern supports the parallel-trend assumption and strengthens the causal interpretation of our findings.

For omitted variables and confounding factors to explain the baseline results in Section 3.1 and the difference-in-differences-in-differences result here, its change has to correlate with local scandals, the patent output of focal firms, and the sensitivity of innovation to the facial traits of hired managers. It is far from clear how this might occur.

One possibility might be that a local corruptive culture or social norm influences financial fraud by a nearby unrelated firm and the selection by facial traits of the treated firm's CEO. However, this does not provide any clear explanation for why fraud would increase the sensitivity of innovation to facial trust.

Alternatively, poor business prospects in a region may increase a nearby unrelated firm's financial fraud likelihood and decrease the incentive for a treated firm to innovate. However, again this does not explain why fraud would increase the sensitivity of innovation to facial trust. Overall, the most convincing interpretation of the difference-in-difference-in-difference tests is that CEO perceived trustworthiness promotes innovation, and that nearby fraud strengthens that relationship.

As an alternative measure of innovation, we repeat the test by replacing the dependent variable with the number of forward citations, *Ln(FORWARD CITATIONS)*. As seen in Table 6 column (3), the estimated coefficients of *CEO TRUST* and the triple interaction term, *CEO TRUST* × *TREAT* × *POST*, continue to be positive and statistically significant. In terms of economic magnitudes, for treated firms, a one-standard-deviation greater *CEO TRUST* translates to about a 13.9% (= 0.476 × 0.291 × 100%) more forward citations received following a local peer financial scandal, which is approximately 8.1 (= 0.291 / 0.036, which is the estimated coefficient of standalone term *CEO TRUST*) times the overall trust effect. Table 6 column (4) shows the estimation results for the dynamic test. These support the parallel-trend assumption. The estimated results are visualized in Figure 4(b). Overall, the causal effect of CEO perceived trustworthiness extends to innovation quality as measured by forward citations.

3.3 Underlying Mechanisms: Innovation Riskiness and Efficiency

Next, we propose and test two possible mechanisms by which trustworthy CEOs can cause more corporate innovation: (i) motivating greater risk-taking in project selection, and (ii) enhancing innovation efficiency by encouraging greater effort during the innovation process. As discussed earlier, when shareholders trust CEOs more, they are more willing to support promising but risky projects by CEOs. In addition, when inventors trust the promises of CEOs more (such as job security and high payoffs upon success), they are more willing to propose and implement risky projects. Furthermore, greater employee trust and effort promote efficient corporate operations, including innovation activities.

We examine the association between CEO perceived trustworthiness and two empirical proxies of innovation riskiness and efficiency. To measure innovation riskiness, we use the natural logarithm of the standard deviation of the number of five-year forward citations received by patents filed by a firm, *Ln*(*SD FORWARD CITATIONS*) (Amore, Schneider, and Žaldokas 2013). To measure innovation efficiency, we use the natural logarithm of the number of filed patents scaled by a firm's five-year rolling R&D intensity, *Ln*(*PATENT to RD*) (Hirshleifer, Hsu, and Li 2013).

As shown in Table 7, *CEO TRUST* is positively and significantly associated with both *Ln*(*SD FORWARD CITATIONS*) and *Ln*(*PATENT to RD*). In terms of economic magnitudes, a one standard deviation greater *CEO TRUST* is associated with 15.5% (= 0.476 × 0.325 × 100%) greater innovation riskiness (column 2) and a 23.8% (= 0.476 × 0.499 × 100%) greater innovation efficiency (column 5). We also re-run the regressions using $CEO\ TRUST_{RESIDUAL}$ and obtain similar inferences. The full regression results showing the estimated coefficients for control variables are tabulated in Online Appendix Table OA7. Together, these results provide insight into why firms with trustworthy CEOs have better innovation performance: firms with such CEOs pursue riskier projects and are more efficient in converting R&D investment into patent output.

3.4 Robustness Checks

We performed a battery of tests to evaluate robustness of the relation between CEO perceived trustworthiness and corporate innovation performance. We tabulate these results in Table 8.

3.4.1 CEO Inherited Trust

First, we test the robustness of our results to controlling for CEO inherited trust (Nguyen, 2025). CEO inherited trust captures a CEO's generalized propensity to trust others (including employees), which is culturally transmitted from their ancestral ethnic origin. Importantly, our construct of CEO perceived trustworthiness, which reflects the extent to which *others trust the CEO*, is conceptually distinct from CEO inherited trust (the extent to which a CEO places trust in *others*). To measure CEO inherited trust, we infer the ethnic origin of each CEO and map it to the corresponding inherited trust score following Nguyen (2025).[28] As reported in Table 8, Panel A, the coefficients on *CEO TRUST* remain positive and statistically significant, and their magnitudes are highly comparable to those in the main results.

3.4.2 Alternative Measures of Corporate Innovation

We next verify robustness by testing whether similar results hold when using alternative measures of corporate innovation output as the dependent variable of Equation (1). Our first alternative measure is the inverse hyperbolic sine of the number of patents (Card and DellaVigna 2020). As shown in column (1) of Table 8, Panel B, the coefficient on *CEO TRUST* remains positive and statistically significant.

In recognition of the fact that innovation activities are typically long-term, our next measure of innovative performance is the average number of patents over a three-year window ($t + 1$ to $t + 3$). As shown in column (2) of Table 8, Panel B, the estimated coefficient for *CEO TRUST* remains

[28] Specifically, we use NamSor to identify CEO ethnicity. NamSor is a machine learning based software trained on historical census data. Past research has validated its classification accuracy (error rate below 1%, Bursztyn, Chaney, Hassan, and Rao 2022) and used it to identify the ethnicity of various capital-market participants (e.g., Krishnan, Singer, and Zhang 2023). For each CEO, we obtain the top five most likely ethnicities, match them to corresponding inherited trust values, and then compute the average. To match each ethnicity to its inherited trust value, we use the inherited trust scores reported in Table A1 of Nguyen (2025).

highly significant and economically comparable to the baseline (0.248 versus 0.246 as in the baseline).

To examine the extensive margin (i.e., whether a firm engages in patenting activities), our next innovation measure is an indicator variable, *PATENT INDICATOR*, equal to one if a firm has at least one patent in a year, and zero otherwise. We estimate a linear probability model (LPM) as suggested by Alcácer and Gittelman (2006) and report the results in column (3) of Table 8, Panel B. The estimated coefficient for *CEO TRUST* is 0.050. This indicates that a one-standard-deviation increase in *CEO TRUST* is associated with a 2.4% (= 0.476 × 0.050 × 100%) higher probability of engaging in patenting activities.

The positive relation between *CEO TRUST* and *Ln(FORWARD CITATIONS)* is also highly robust to the use of alternative measures of forward citations. As shown in columns (4)-(6) of Table 8, Panel B, the estimated coefficients on *CEO TRUST* all remain positive and significant.

3.4.3 Alternative Regression Specifications

To address possible concerns about nonlinearities and the log one-plus transformation, we follow Cohn, Liu, and Wardlaw (2022) and estimate Poisson and negative binomial models using the raw number of patents as the dependent variable. As shown in columns (1) and (2) of Table 8, Panel C, the estimated coefficients are both positive and statistically significant. The implied effects of a one-standard-deviation greater *CEO TRUST* range from a 29.1% to 34.1% (= $e^{0.476 \times 0.538} - 1$ and $e^{0.476 \times 0.616} - 1$) greater patent output, representing approximately 2.5 to 2.9 (= 0.291 / 0.117 and 0.341 / 0.117) times the baseline effect.

We also use the raw number of forward citations as the dependent variable. As shown in columns (4) and (5), the estimated coefficients remain positively significant. A one-standard-deviation greater *CEO TRUST* is associated with a 58.5% to 65.4% (= $e^{0.476 \times 0.967} - 1$ and $e^{0.476 \times 1.057} - 1$) more forward citations, which is about 2.3 to 2.5 (= 0.585 / 0.259 and 0.654 / 0.259) times the baseline effect.[29]

[29] We do not use these nonlinear models in our main specification for two reasons. First, the identifying assumptions required in nonlinear models are very restrictive in practice (Wooldridge 2002). For example, Poisson regression assumes that the mean and variance of the dependent variable are equal; however, in our sample, the variance of *PATENTS* is 4583.3 (= 67.7^2), which is 269.6 (= 4583.3 / 17.0) times the mean; the variance of *FORWARD CITATIONS* is 2,453,922.3 (= 1566.5^2), which is 11,987.9 (= 2,453,922.3 / 204.7) times the mean. They both indicate substantial overdispersion. Second, Poisson regression with firm fixed effects drops firms with zero patents (or

To address alternative explanations related to local culture factors (apart from our use of the fraud differences-in-differences-in-differences test), we include year times firm headquarters' CBSA fixed effects in the main specification. As shown in columns (3) and (6), while more than 12% of observations become singletons under this more stringent specification and are dropped from regressions, the estimated coefficients for *CEO TRUST* remain positively significant.[30]

3.4.4 Subsample Analyses

Having documented that CEO trustworthiness increases the likelihood that a firm engages in patenting activities (the extensive margin, Section 3.4.2), we examine whether the effects of trust on innovation also operate through greater patenting intensity among innovating firms (the intensive margin). To do so, we re-estimate Equation (1) using the subsample of firm-years observations with non-zero patents (i.e., *PATENTS* > 0) and non-zero forward citations (i.e., *FORWARD CITATIONS* > 0). As shown in columns (1) and (4) of Table 8, Panel D, the estimated coefficient on *CEO TRUST* is positive and statistically significant. In terms of economic magnitude, within the subsample of non-zero patents firms, a one-standard-deviation greater *CEO TRUST* is associated with 22.7% (= 0.476 × 0.476 × 100%) more patents, which is about 1.9 (= 0.227 / 0.117) times the baseline effect.

It is also useful to know, from the viewpoint of robustness, whether effects are similar across time periods. We split the sample into non-recent (i.e., before 2010) and recent (i.e., after 2010) cohorts. As shown in columns (2) and (3) of Table 8, Panel D, when using *Ln(PATENTS)* as the dependent variable, the estimated coefficients across the two cohorts are highly similar (i.e., 0.253 versus 0.252 for the non-recent and recent cohorts, respectively), and the difference in coefficients on *CEO TRUST* between the two subsamples is statistically insignificant ($p > 0.1$). When using *Ln(FORWARD CITATIONS)* as the dependent variable, the estimated coefficient of *CEO TRUST* for the non-recent cohort is larger than the recent cohort (i.e., 0.775 versus 0.369 for the non-recent and recent cohorts, respectively), but the difference in coefficients between the two subsamples is

---

forward citations). However, observed ex post zero patents or forward citations do not necessarily indicate a lack of ex ante intention to innovate.

[30] A related alternative explanation is corporate culture (Li et al. 2025). In untabulated tests, we find that (i) CEO perceived trustworthiness has very low correlations with corporate culture ($\rho = 0.03$) and its five specific dimensions, and (ii) after controlling for corporate culture (or five specific dimensions), *CEO TRUST* remains positive and highly statistically significant.

not statistically significant ($p > 0.1$). These results are reported in columns (5) and (6) of Table 8, Panel D.

3.4.5 Controlling for Additional CEO Characteristics

We further test the robustness of our findings by controlling for additional CEO characteristics. These consist of the CEO facial width-to-height ratio (*FWHR*; Jia et al. 2014), youthfulness/attractiveness, and dominance (*YOAT* and *DOM*; Vernon et al. 2014; Peng et al. 2022), CEO ability (*ABILITY*; Demerjian, Lev, and McVay 2012), and CEO education discipline and skillsets (*STEM*, *SCIENCE SKILLS*, and *TECH SKILLS*; Hsu, Li, and Pan 2025). We do not include these variables in the baseline specification because the CEO discipline and skillsets data are extracted from the BoardEx database, which is only available for the subsample after 2000. After including these variables, the coefficients on *CEO TRUST* remain highly comparable in economic magnitude and statistical significance for both patents and forward citations. These findings reinforce the robustness of our main conclusion that CEO perceived trustworthiness enhances corporate innovation performance. The estimation results tabulated in Table 8, Panel E suggest that the effect of CEO perceived trustworthiness is distinct from other known characteristics we can think of.

4. Stakeholder Incentives and Analyst Beliefs

4.1 Employee Motivation

To examine the incentives of employees behind innovation activities, we first test whether CEO perceived trustworthiness enhances corporate innovation by increasing the effectiveness of employee stock options in motivating effort. We hypothesize that trustworthy CEOs motivate rank-and-file employees to be more optimistic about firm prospects. As such, employees will tend to place greater value on their granted stock options, which can make option compensation more effective in incentivizing greater effort on innovation. To estimate the number of stock options granted to rank-and-file employees (*EMPLOYEE STOCK OPTIONS*), we follow the approaches of Call, Kedia, and Rajgopal (2016) and Holderness, Huffman, and Lewis-Western (2019). We add this constructed variable and its interaction with *CEO TRUST* in Equation (1).

As shown in Table 9, Panel A, the coefficient on *EMPLOYEE STOCK OPTIONS* is positive and significant, consistent with a beneficial effect on innovation. More relevant for our hypothesis, the interaction term of *CEO TRUST × EMPLOYEE STOCK OPTIONS* is positive and highly significant. This is consistent with trustworthy CEOs being better positioned to motivate employees with stock options. Economically, holding the level of employee stock options constant, a one-standard-deviation greater *CEO TRUST* is associated with a 95.2% (= [0.476 × 0.010] / 0.005 × 100%) greater effect of employee stock options on patents. This greater trust is also associated with 115.0% (= [0.476 × 0.029] / 0.012 × 100%) more positive effect on forward citations.

4.2 Institutional Investors' Support

Institutional investors can provide valuable resources and exert monitoring that encourages long-term innovation investments (Aghion, Van Reenen, and Zingales 2013). However, their willingness to support such risky projects often depends on their confidence in the CEO's competence and integrity. Accordingly, we expect perceived trustworthiness of CEOs to enhance innovation through strengthening the positive relation between institutional investors and innovation-related expenditures. This can occur through institutional investors trusting the CEO more, or through institutional investors recognizing the positive effects of employees trusting the CEO more. We therefore test whether CEO perceived trustworthiness strengthens the positive relation between institutional investor ownership and corporate innovation.

To test this, we regress subsequent R&D expenditures on the interaction of *CEO TRUST* with decile-ranked institutional ownership. As shown in column (1) of Table 9, Panel B, the estimated coefficient on the interaction term is positive and significant. This is consistent with institutional ownership being more effective in promoting innovation when the CEO is perceived as trustworthy.

We then decompose institutional ownership into dedicated, quasi-indexer, and transient institutional ownership following Bushee (1998) and interact each with *CEO TRUST*. The results, reported in column (2) of Table 9, Panel B, reveal two key insights. First, both the standalone term of *INSTITUTION (DEDICATED)* and its interaction with *CEO TRUST* are positive and significant, indicating that perceived trustworthiness of CEOs further enhances the positive relation between dedicated institutional ownership and innovation. Second, while the standalone term of *INSTITUTION (TRANSIENT)* is insignificant, its interaction with *CEO TRUST* is positive and significant. This suggests that perceived trustworthiness of CEOs can induce some transient institutional investors, who typically do not favor long-term risky projects, to be supportive of innovation.

4.3 Perceived Information Asymmetries of Financial Analysts

Finally, we examine whether perceived CEO trustworthiness mitigates perceived information asymmetries for stock investors. Financial analysts play a vital role in addressing information asymmetry by interpreting and communicating the prospects of firms to the investors. We expect that CEOs who are perceived to be more trustworthy are perceived to provide more precise and transparent information to stock investors and financial analysts. This will tend to promote consensus about firm prospects.

To test this hypothesis, we construct *FORECAST DISPERSION*, the standard deviation of the latest earnings forecasts issued by all analysts covering a firm. Lower forecast dispersion indicates greater agreement among analysts, which is more likely to occur when analysts perceive the messages from CEOs to be valid and informative.

As shown in Table 9, Panel C, CEO perceived trustworthiness is associated with lower forecast dispersion. Economically, a one-standard-deviation increase in *CEO TRUST* is associated with a 24.2% (= [0.476 × –0.028] / 0.055 × 100%) decrease in forecast dispersion compared with the sample mean. This result, together with the finding in Section 4.2, confirms that trustworthy-looking CEOs are indeed perceived as delivering valuable information to the market, which can mitigate information asymmetries for outside investors and thus win their support in innovation investment.

Taken together, this empirical evidence suggests that CEO perceived trustworthiness promotes corporate innovation through two main incentive and belief channels: enhancing the motivational effect of employee compensation within the firm and reducing perceived information asymmetries to gain support from investors outside the firm. These tests also reinforce our main conclusion that trustworthy CEOs help foster corporate innovation.

5. Heterogeneous Effects of Trust

To determine when CEO perceived trustworthiness has stronger effects, we examine two characteristics that shape its importance to existing stakeholders: the type of CEO appointment (internal versus external) and CEO tenure (the number of years a CEO has worked for a firm).

5.1 CEO Type

Unlike internally promoted CEOs, who have established records within the firm and long-term relationships with its stakeholders, externally appointed CEOs lack pre-existing credibility and are less known by stakeholders. As a result, employees, board members, and investors rely more on observable cues, such as perceived trustworthiness, to assess the intention of the CEO. We therefore expect the effect of CEO perceived trustworthiness to be more pronounced for externally appointed CEOs.

To test this, we partition the sample into two subsamples based on CEO type and re-estimate Equation (1) separately for each subsample. Using data from ExecuComp, a CEO is classified as external if the CEO is appointed from outside the firm, and internal otherwise. Columns (1) and (2) of Table 10, Panel A show the regression results for these two subsamples. Consistent with our expectations, the estimated coefficient for *CEO TRUST* is significantly associated with future patents only in the external CEO subsample. In the externally appointed subsample, a one-standard-deviation greater *CEO TRUST* is associated with 18.2% (= 0.476 × 0.383 × 100%) more patents in the following year, which is 2.6 (= 0.383 / 0.145) times that for the internal CEO subsample. The differences in coefficients on *CEO TRUST* between the two subsamples are both statistically significant. Similar results are found in columns (3) and (4) for forward citations.

5.2 CEO Tenure

Next, we investigate the role of CEO tenure. As discussed earlier, novelty from a new face invites attention, but this novelty effect wears off eventually as familiarity builds. Accordingly, we hypothesize that the impact of CEO perceived trustworthiness is more pronounced for CEOs with low within-firm tenure.

To test this, we partition the sample into two subsamples based on CEO tenure and re-estimate Equation (1) for the subsamples. A CEO is defined to have a high tenure if the number of years that an externally appointed CEO has worked for a firm is above the sample median, and a low tenure otherwise. Columns (1) and (2) of Table 10, Panel B show the regression results for these two subsamples using patents as the dependent variable.

Consistent with our expectations, the estimated coefficient for *CEO TRUST* is only significant in the low CEO tenure subsample. In the low-tenure subsample, one-standard-deviation greater *CEO TRUST* is associated with 18.7% (= 0.476 × 0.394 × 100%) more patents in the following year. The estimated effect of *CEO TRUST* in the low tenure subsample is 3.8 (= 0.394 / 0.105) times that of the high tenure subsample, in which the estimated coefficient for *CEO TRUST* is not statistically significant. The difference in coefficients on *CEO TRUST* between the two subsamples is statistically significant. Columns (3) and (4) of Table 10, Panel B show the regression results using forward citations as the dependent variable.

In summary, these findings suggest that CEO perceived trustworthiness is particularly important in new social interactions: When stakeholders have limited prior exposure to the CEO, they rely more heavily on the CEO's appearance to form judgments.

6. Conclusion

Innovation relies heavily on effective communication and coordination within teams. Human decision-making is influenced by subjective judgments, including spontaneous impressions of trustworthiness based on facial traits. Such judgements and decisions about trust arose in human evolutionary history as an adaptive trait.

This study applies a validated method (Vernon et al. 2014) to quantify CEO perceived trustworthiness using AI-based facial analysis and examines its association with firm innovation. Consistent with the validity of our measure, perceived CEO trustworthiness correlates strongly with higher employee ratings, greater shareholder support in proxy votes, and quicker analyst revisions of earnings forecasts.

We find that U.S. publicly listed firms led by trust-looking CEOs produce a higher quantity and quality of patents. In general, these firms pursue riskier projects and are more efficient in converting R&D investment into patent output. This relation is robust across an extensive range of robustness checks. For identification, we use financial fraud among local peers as an external shock to the importance of perceived trustworthiness. This difference-in-difference-in-difference test confirms causality from perceived trustworthiness to patent outcomes. We also provide evidence about the incentives behind the effect. Perceived CEO trustworthiness strengthens the effect of option compensation on motivating employees, enhances the effect of institutional investor ownership on R&D, and, consistent with reduced perceived information asymmetry, reduces analyst forecast dispersion. The trust-innovation relation is especially pronounced when CEOs are relatively new to stakeholders, consistent with judgements of trustworthiness being more important in new professional relationships. Collectively, our tests highlight that perceived CEO trustworthiness facilitates the collaboration necessary for technological innovation.

References

Acharya, V. V., R. P. Baghai, and K. V. Subramanian. 2014. Wrongful discharge laws and innovation. *Review of Financial Studies* 27 (1): 301–346.

Agarwal, V., Y. E. Arısoy, and T. Trinh. 2025. Eponymous hedge funds. Working paper, Georgia State University and NEOMA Business School.

Agarwal, V., Y. Lu, and S. Ray. 2021. Are hedge funds' charitable donations strategic? *Journal of Corporate Finance* 66: 101842.

Aghion, P. and J. Tirole. 1994a. Opening the black box of innovation. *European Economic Review* 38 (3-4): 701–710.

Aghion, P. and J. Tirole. 1994b. The management of innovation. *The Quarterly Journal of Economics* 109 (4): 1185–1209.

Aghion, P., J. Van Reenen, and L. Zingales. 2013. Innovation and institutional ownership. *American Economic Review* 103 (1): 277–304.

Alcácer, J., and M. Gittelman. 2006. Patent citations as a measure of knowledge flows: The influence of examiner citations. *Review of Economics and Statistics* 88 (4): 774–779.

Amihud, Y. 2002. Illiquidity and stock returns: Cross-section and time-series effects. *Journal of Financial Markets* 5 (1): 31–56.

Amore, M. D., C. Schneider, and A. Žaldokas. 2013. Credit supply and corporate innovation. *Journal of Financial Economics* 109 (3): 835-855.

Audi, R., T. Loughran, and B. McDonald. 2016. Trust, but verify: MD&A language and the role of trust in corporate culture. *Journal of Business Ethics* 139 (3): 551–561.

Baker, A. C., D. F. Larcker, and C. C. Y. Wang. 2022. How much should we trust staggered difference-in-differences estimates? *Journal of Financial Economics* 144 (2): 370–395.

Balkin, D. B., G. B. Markman, and L. R. Gomez-Mejia. 2000. Is CEO pay in high-technology firms related to innovation? *Academy of Management Journal* 43 (6): 1118–1129.

Barker, V. L., and G. C. Mueller. 2002. CEO characteristics and firm R&D spending. *Management Science* 48 (6): 782–801.

Barrios, J. M. 2024. Staggeringly problematic: A primer on staggered DiD for accounting researchers. Working paper, University of Rochester.

Barro, R. J., and R. M. McCleary. 2003. Religion and economic growth across countries. *American Sociological Review* 68 (5): 760–781.

Bernile, G., V. Bhagwat, and P. R. Rau. 2017. What doesn't kill you will only make you more risk-loving: Early-life disasters and CEO behavior. *Journal of Finance* 72 (1): 167–206.

Beugelsdijk, S., H. L. F. de Groot, and A. B. T. M. van Schaik. 2004. Trust and economic growth: A robustness analysis. *Oxford Economic Papers* 56 (1): 118–134.

Blankespoor, E., B. E. Hendricks, and G. S. Miller. 2017. Perceptions and price: Evidence from CEO presentations at IPO roadshows. *Journal of Accounting Research* 55 (2): 275–327.

Breuer, W., A. Knetsch, and A. J. Salzmann. 2020. What does it mean when managers talk about trust? *Journal of Business Ethics* 166 (3): 473–488.

Bursztyn, L., T. Chaney, T. Hassan, and A. Rao. 2022. The immigrant next door. *American Economic Review* 114 (2): 348–84.

Bushee, B. J. 1998. The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review* 73 (3): 305–333.

Call, A. C., S. Kedia, and S. Rajgopal. 2016. Rank and file employees and the discovery of misreporting: The role of stock options. *Journal of Accounting and Economics* 62 (2-3): 277–300.

Card, D., and S. DellaVigna. 2020. What do editors maximize? Evidence from four economics journals. *Review of Economics and Statistics* 102 (1): 195–217.

Cho, M., G. V. Krishnan, and H. Cho. 2024. Can we trust the trust words in 10-Ks? *Journal of Business Ethics* 190 (4): 975–992.

Cohn, J. B., Z. Liu, and M. I. Wardlaw. 2022. Count (and count-like) data in finance. *Journal of Financial Economics* 146 (2): 529–551.

Dechow, P. M., W. Ge, C. R. Larson, and R. G. Sloan. 2011. Predicting material accounting misstatements. *Contemporary Accounting Research* 28 (1): 17–82.

Demerjian, P., B. Lev, and S. McVay. 2012. Quantifying managerial ability: A new measure and validity tests. *Management Science* 58 (7): 1229–1248.

Dirks, K. T., and D. L. Ferrin. 2001. The role of trust in organizational settings. *Organization Science* 12 (4): 450–467.

Dong, M., D. Hirshleifer, and S. H. Teoh. 2021. Misvaluation and corporate inventiveness. *Journal of Financial and Quantitative Analysis* 56 (8): 2605–2633.

Duarte, J., S. Siegel, and L. Young. 2012. Trust and credit: The role of appearance in peer-to-peer lending. *Review of Financial Studies* 25 (8): 2455–2484.

Eesley, C., and S. Y. Lee. 2023. In institutions we trust? Trust in government and the allocation of entrepreneurial intentions. *Organization Science* 34 (2): 532–556.

Edmans, A. 2012. The link between job satisfaction and firm value, with implications for corporate social responsibility. *Academy of Management Perspectives* 26 (4): 1–19.

Fan, J. P., T. J. Wong, and T. Zhang. 2007. Politically connected CEOs, corporate governance, and post-IPO performance of China's newly partially privatized firms. *Journal of Financial Economics* 84 (2): 330–357.

Guenzel, M., S. Kogan, M. Niessner, and K. Shue. 2025. AI personality extraction from faces: Labor market implications. Working paper, University of Pennsylvania, Reichman University, Indiana University, and Yale University.

Guilbeault, D., S. Delecourt, and B. S. Desikan. 2025. Age and gender distortion in online media and large language models. *Nature* 646 (8087): 1129–1137.

Guilbeault, D., S. Delecourt, T. Hull, B. S. Desikan, M. Chu, and E. Nadler. 2024. Online images amplify gender bias. *Nature* 626 (8001): 1049–1055.

Guiso, L., P. Sapienza, and L. Zingales. 2006. Does culture affect economic outcomes? *Journal of Economic Perspectives* 20 (2): 23–48.

Guiso, L., P. Sapienza, and L. Zingales. 2008. Trusting the stock market. *Journal of Finance* 63 (6): 2557–2600.

Guzman, J., and A. O. Kacperczyk. 2019. Gender gap in entrepreneurship. *Research Policy* 48 (7): 1666–1680.

He, J., and X. Tian. 2013. The dark side of analyst coverage: The case of innovation. *Journal of Financial Economics* 109 (3): 856–878.

Heese, J., G. Pérez-Cavazos, and C. D. Peter. 2023. When executives pledge integrity: The effect of the accountant's oath on firms' financial reporting. *The Accounting Review* 98 (7): 261–288.

Hirshleifer, D., A. Low, and S. H. Teoh. 2012. Are overconfident CEOs better innovators? *Journal of Finance* 67 (4): 1457–1498.

Hirshleifer, D., P.-H. Hsu, and D. Li. 2013. Innovative efficiency and stock returns. *Journal of Financial Economics* 107(3): 632–654.

Holderness, D. K., A. Huffman, and M. Lewis-Western. 2019. Rank and file equity compensation and earnings management: Evidence from stock options. *Journal of Business Finance & Accounting* 46 (9-10): 1201–1236.

Holmstrom, B. 1989. Agency costs and innovation. *Journal of Economic Behavior & Organization* 12 (3): 305–327.

Hope, O. K., and J. Wang. 2018. Management deception, big-bath accounting, and information asymmetry: Evidence from linguistic analysis. *Accounting, Organizations and Society* 70: 33–51.

Hsieh, T. S., J. B. Kim, R. R. Wang, and Z. Wang. 2020. Seeing is believing? Executives' facial trustworthiness, auditor tenure, and audit fees. *Journal of Accounting and Economics* 69 (1): 101260.

Hsu, P.-H., H. H. Lee, and L. Yi. 2024. Corporate social responsibility and external disruptions. *Journal of Corporate Finance* 89: 102675.

Hsu, P.-H., K. Li, and Y. Pan. 2025. The eco-gender gap in boardrooms. *Management Science*, forthcoming.

Jensen, M. C., and W. H. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (4): 305–360.

Jha, M. J. Qian, M. Weber, and B. Yang. 2024. Generative AI, managerial expectations, and economic activity. Working paper, Georgia State University, Rochester Institute of Technology, and Purdue University.

Jia, Y., L. V. Lent, and Y. Zeng. 2014. Masculinity, testosterone, and financial misreporting. *Journal of Accounting Research* 52 (5): 1195–1246.

Knack, S. and P. Keefer. 1997. Does social capital have an economic pay-off? A cross-country investigation. *The Quarterly Journal of Economics*, 112 (4): 1251–1288

Kogan, L., D. Papanikolaou, A. Seru, and N. Stoffman. 2017. Technological innovation, resource allocation, and growth. *The Quarterly Journal of Economics* 132 (2): 665–712.

Krishnan, G., Z. Singer, and J. Zhang. 2023. Audit partner ethnicity and salient audit phenomena. *Accounting, Organizations and Society*, 101440.

Larcker, D. F. and A. A. Zakolyukina. 2012. Detecting deceptive discussions in conference calls. *Journal of Accounting Research* 50 (2): 495–540.

Li, K., F. Mai, R. Shen, C. Yang, and T. Zhang. 2025. Dissecting corporate culture using generative AI. *The Review of Financial Studies*, forthcoming.

Linke, L., S. A. Saribay, and K. Kleisner. 2016. Perceived trustworthiness is associated with position in a corporate hierarchy. *Personality and Individual Differences* 99: 22–27.

Liu, X. 2016. Corruption culture and corporate misconduct. *Journal of Financial Economics* 122 (2): 307–327.

Manso, G. 2011. Motivating innovation. *Journal of Finance* 66 (5): 1823–1860.

Mao, C. X., and C. Zhang. 2018. Managerial risk-taking incentive and firm innovation: Evidence from FAS 123R. *Journal of Financial and Quantitative Analysis* 53 (2): 867–898.

Nguyen, K. T. 2025. Trust and innovation within the firm: Evidence from matched CEO-firm data. Conditionally accepted, *Quarterly Journal of Economics*.

Oosterhof, N. N., and A. Todorov. 2008. The functional basis of face evaluation. *Proceedings of the National Academy of Sciences* 105 (32): 11087–11092.

Peng, L., S. H. Teoh, Y. Wang, and J. Yan. 2022. Face value: Trait impressions, performance characteristics, and market outcomes for financial analysts. *Journal of Accounting Research* 60 (2): 653–705.

Ruppel, C. P., and S. J. Harrington. 2000. The relationship of communication, ethical work climate, and trust to commitment and innovation. *Journal of Business Ethics* 25 (4): 313–328.

Sagonas, C., E. Antonakos, G. Tzimiropoulos, S. Zafeiriou, and M. Pantic. 2016. 300 faces in-the-wild challenge: Database and results. *Image and Vision Computing* 47: 3–18.

Seru, A. 2014. Firm boundaries matter: Evidence from conglomerates and R&D activity. *Journal of Financial Economics* 111 (2): 381–405.

Sheng, J., Z. Sun, B. Yang, and A. L. Zhang. 2024. Generative AI and asset management. Forthcoming, *Review of Financial Studies*.

Shleifer, A., and L. Summers. 1988. Breach of Trust in Hostile Takeovers. In *Corporate Takeovers: Causes and Consequences*, 33–56. Chicago: University of Chicago Press.

Sliwka, D. 2007. Trust as a signal of a social norm and the hidden costs of incentive schemes. *American Economic Review* 97 (3): 999–1012.

Sutherland, C. A., J. A. Oldmeadow, I. M. Santos, J. Towler, D. Michael Burt, and A. W. Young. 2013. Social inferences from faces: Ambient images generate a three-dimensional model. *Cognition* 127 (1): 105–118.

Tian, X., J. Yan, and L. Zuo. 2025. Do shared auditors facilitate follow-on innovation? *Journal of Accounting Research*, forthcoming.

Todorov, A. B. 2017. Face Value: The Irresistible Influence of First Impressions. Princeton: Princeton University Press.

Todorov, A., M. Pakrashi, and N. N. Oosterhof. 2009. Evaluating faces on trustworthiness after minimal time exposure. *Social Cognition* 27 (6): 813–833.

Trajtenberg, M., R. Henderson, and A. Jaffe. 1997. University versus corporate patents: a window on the basicness of invention. *Economics of Innovation and New Technology* 5 (1): 19–50.

Vernon, R. J. W., C. A. M. Sutherland, A. W. Young, and T. Hartley. 2014. Modeling first impressions from highly variable facial images. *Proceedings of the National Academy of Sciences* 111 (32): E3353–E3361.

Willis, J. and A. Todorov. 2006. First impressions: Making up your mind after a 100-ms exposure to a face. *Psychological Science* 17 (7): 592–598.

Wilson, J. P. and N. O. Rule. 2015. Facial trustworthiness predicts extreme criminal-sentencing outcomes. *Psychological Science* 26 (8): 1325–1331.

Wooldridge, J. M. 2010. *Econometric Analysis of Cross Section and Panel Data* (2nd ed.). MIT Press, Cambridge, MA.

Xie, F., B. Zhang, and W. Zhang. 2022. Trust, incomplete contracting, and corporate innovation. *Management Science* 68 (5): 3419–3443.

Yi, J., J. Chu, and I. P. Png. 2022. Early-life exposure to hardship increased risk tolerance and entrepreneurship in adulthood with gender differences. *Proceedings of the National Academy of Sciences* 119 (15): e2104033119.

Zak, P. J. and S. Knack. 2001. Trust and growth. *The Economic Journal* 111 (470): 295–321.

Appendix 1. Variable Definition

Variable	Definition
PATENTS	The number of patents filed by a firm. Data Source: PatentsView.org.
FORWARD CITATIONS	The number of forward citations received by the patents filed by a firm. Data Source: PatentsView.org.
CITATIONS PER PATENT	The average number of forward citations received by each of a firm's filed patents. Data Source: Kogan et al. (2017) patent database.
$VALUER	The average real dollar value of a firm's filed patents. Data Source: Kogan et al. (2017) patent database.
$VALUEN	The average nominal dollar value of a firm's filed patents. Data Source: Kogan et al. (2017) patent database.
NOVELTY	The average patent novelty of a firm's filed patents. The novelty of each patent is computed as the class- and year-adjusted citations received over time (Seru 2014; Dong et al. 2021). Data Source: PatentsView.org.
SCOPE	The average patent scope of a firm's filed patents. The scope of each patent is computed as 1 minus the Herfindahl index across technological classes of future citations of the patent (Trajtenberg et al. 1997; Dong et al. 2021). Data Source: PatentsView.org.
ORIGINALITY	The average patent originality of a firm's filed patents. The originality of each patent is computed as 1 minus the Herfindahl concentration index for the fraction of citations made by the patent to patents in other technological classes (Trajtenberg et al. 1997; Dong et al. 2021). Data Source: PatentsView.org.
SD FORWARD CITATIONS	The standard deviation of the number of five-year forward citations received by patents filed by a firm. The five-year period is from year t to year $t + 4$. Data Source: PatentsView.org.
PATENTS to RD	The number of patents filed by a firm in year $t + 1$ divided by the firm's five-year rolling R&D intensity (i.e., $[RD_t + 0.8 \times RD_{t-1} + 0.6 \times RD_{t-2} + 0.4 \times RD_{t-3} + 0.2 \times RD_{t-4}] / 5$). Data Source: PatentsView.org, Compustat.
CEO TRUST	The trustworthiness score of the CEO, calculated using the facial attributes of the CEO's LinkedIn profile photo (Peng et al. 2022). Data Source: LinkedIn.
CEO TRUST$_{RESIDUAL}$	The residual of *CEO TRUST*, defined as the residual from regressing *CEO TRUST* on all CEO-level control variables. These variables include *FEMALE*, *AGE*, *TENURE*, *EDU*, *SALARY*, *BONUS*, *EQUITY HOLDINGS*, *NEW OPTION PPS*, *NEW STOCK PPS*, *DELTA*, and *VEGA*. In addition, we have removed variations of other CEO facial characteristics such as facial width-to-height ratio, youthfulness/attractiveness, and dominance. Data Source: LinkedIn, CRSP, ExecuComp, and Coles et al. (2006).
SIZE	The natural logarithm of book value of total assets. Data Source: Compustat.
RD	The research and development (R&D) expenditure divided by the book value of total assets. Data Source: Compustat.
FIRM AGE	The firm age, calculated as the natural logarithm of one plus the number of years that a firm is listed on Compustat. Data Source: Compustat.
ROA	The operating income before depreciation divided by the book value of total assets.

	Data Source: Compustat.
PPE	The net property, plant, and equipment (PP&E) divided by the book value of total assets. Data Source: Compustat.
LEVERAGE	The book value of debt divided by the book value of total assets. Data Source: Compustat.
CAPEX	The capital expenditure divided by the book value of total assets. Data Source: Compustat.
TOBIN Q	A firm's Tobin's Q, measured as the sum of the market value of equity and the book value of debt to the sum of the book value of equity and book value of debt. Data Source: Compustat.
KZ INDEX	The Kaplan and Zingales index, calculated as (-1.002 × cash flow / Net PP&E + 0.283 × Tobin's Q + 3.139 × Leverage - 39.36 × Dividends / Net PP&E - 1.315 × cash holding / Net PP&E). Net PP&E is lagged. Data Source: Compustat.
HHI	The Herfindahl index of revenue of the four-digit SIC industry to which a firm belongs. Data Source: Compustat.
HHI SQUARED	The squared Herfindahl index of revenue of the four-digit SIC industry to which a firm belongs. Data Source: Compustat.
INSTITUTION	The ownership of institutional investors, calculated as the ratio of their held shares to total shares outstanding. Data Source: Thomson Reuters Institutional Holdings (13F).
ILLIQUIDITY	The average value of the illiquidity measure of Amihud (2002). The illiquidity measure is calculated as the absolute value of daily return divided by the dollar value of trading volume, and it is measured at the daily level. Data Source: CRSP.
FEMALE	An indicator variable equal to one if the CEO is a female, and zero otherwise. Data source: ExecuComp.
AGE	The CEO's age. Data source: ExecuComp.
TENURE	The CEO's tenure in years computed based on the date the individual became chief executive officer. Data source: ExecuComp.
EDU	The CEO's education, which is a discrete variable equal to 1 if the CEO has a bachelor's degree, 2 if the CEO has a master's degree, and 3 if the CEO has a doctor's degree. This variable is coded as 0 if the education experience on the LinkedIn profile is below a bachelor's degree, non-degree, or missing. Data source: LinkedIn.
SALARY	The CEO's annual salary in millions of dollars. Data source: ExecuComp.
BONUS	The CEO's annual bonus in millions of dollars for observations before December 15, 2005. After this date, following Hayes, Lemmon, and Qiu (2012), it is the sum of the annual bonus and nonequity incentives in millions of dollars. Data source: ExecuComp.
EQUITY HOLDINGS	The CEO's equity holdings, calculated as the sum of in-the-money unexercised options (opt_unex_exer_est_val + opt_unex_unexer_est_val) and shares owned (shrown_excl_opts × prcc_f) in millions of dollars. Data source: ExecuComp, CRSP.
NEW OPTION PPS	The sensitivity of the value of newly issued options held by the CEO to a 1% change in stock price. The measure is in millions of dollars. Data source: ExecuComp,

	CRSP.
NEW STOCK PPS	The sensitivity of the value of newly issued stocks held by the CEO to a 1% change in stock price. The measure is in millions of dollars. Data source: ExecuComp, CRSP.
DELTA	The sensitivity of CEO total wealth to price, which is the dollar change in CEO wealth to a 1% change in stock price. Data source: Coles et al. (2006).
VEGA	The sensitivity of CEO total wealth to volatility, which is the dollar change in CEO wealth to a 1% change in a standard deviation of the firm's returns. Data source: Coles et al. (2006).
ABILITY	The managerial ability of a CEO. Data source: Demerjian et al. (2012).
STEM	An indicator variable equal to 1 if a CEO earned a degree in STEM (science, technology, engineering, and mathematics), and 0 otherwise. Data source: Hsu et al. (2025).
SCIENCE SKILLS	An indicator variable equal to 1 if a CEO has experience in scientific research or research and development, and zero otherwise. A CEO has such experience if her prior job roles or job descriptions contain any of the following keywords: researcher, scientist, scientific, research & development, R&D, clinical research, research fellow, or research investigator. Data source: Hsu et al. (2025).
TECH SKILLS	An indicator variable equal to 1 if a CEO has experience in technology, and zero otherwise. A CEO has such experience if her prior job roles or job descriptions contain any of the following keywords: technology, technologist, technologies, CIO, chief information officer, CTO, chief technology officer, innovation, IT, or information technology. Data source: Hsu et al. (2025).
OVERALL RATING	The average of current employees' overall ratings (1 to 5 stars) of a firm. The average is weighted by the number of helpful votes each review receives and is computed for firms with at least 10 reviews in a year. Data source: Revelio Labs.
SENIOR LEADERSHIP	The average of current employees' ratings (1 to 5 stars) of a firm's senior leadership. The average is weighted by the number of helpful votes each review receives and is computed for firms with at least 10 reviews in a year. Data source: Revelio Labs.
BUSINESS OUTLOOK	The average of current employees' ratings (1 = positive, 0 = neutral, and -1 = negative) of a firm's business outlook. The average is weighted by the number of helpful votes each review receives and is computed for firms with at least 10 reviews in a year. Data source: Revelio Labs.
BEST COMPANY	An indicator variable equal to one if a firm is listed on *Fortune* magazine's "100 Best Companies to Work For", and zero otherwise. Data source: Hsu et al. (2024).
FOR VOTES	The average percentage of "for" votes over management-proposed agendas at annual shareholders' meetings. The percentage of "for" votes for each agenda item is calculated as the number of "for" votes divided by the total number of "for", "abstain", and "against" votes. Data source: ISS ESG Voting Analytics.
AGAINST VOTES	The average percentage of "against" votes over management-proposed agendas at annual shareholders' meetings. The percentage of "against" votes for each agenda item is calculated as the number of "against" votes divided by the total number of "for", "abstain", and "against" votes. Data source: ISS ESG Voting Analytics.
FINANCING CASH FLOW	The cash flow of financing activities, calculated as debt issuance (Δat – Δceq –

	Δtxdb) plus sales of stocks (sstk – prstkc) minus the issuance of dividends (dvc + dvp), scaled by the average of current and lagged total equity. Data source: Compustat.
DEBT ISSUANCE	The debt issuance, calculated as the change in assets minus the change in book equity [Δtotal assets (at) – Δbook equity (ceq) – Δdeferred taxes (txdb)], scaled by the average of current and lagged total equity. Data source: Compustat.
CEO TERMINATION	An indicator variable equal to 1 if a firm's CEO is terminated in the following year. Data source: ExecuComp.
FORECAST DISPERSION	The dispersion of analyst forecasts, calculated as the standard deviation of the latest quarterly earnings forecast issued by each stock analyst. Data source: I/B/E/S.
FORECAST SPEED	The speed of analyst forecasts, calculated as the inverse of the median number of days for stock analysts to revise their earnings forecasts after earnings conference calls. Data source: I/B/E/S, Thomson ONE StreetEvents.
EMPLOYEE STOCK OPTIONS	The total number of stock options a firm grants to its rank-and-file employees (in millions). The number of employee stock options is estimated using the methods proposed by Call et al. (2016) and Holderness et al. (2019). Specifically, the number of employee stock options (ESOs) granted to rank-and-file employees is estimated as the total ESOs a firm granted in a year minus the number of ESOs granted to its executives and non-executive managers. To estimate the number of total ESOs granted by a firm, we use two variables in ExecuComp: the number of ESOs granted to an executive (*NUMSECUR*) and the percentage of ESOs granted to an executive (*PCTTOTOPT*). As the number of total ESOs granted by a firm can be estimated from the compensation of each of the top five executives reported in ExecuComp, we use the average value of those estimates. To ensure data reliability, we drop estimates that are not within 1% of each other and use the average value from all remaining executives as the measure of total options granted by the firm. Following Hochberg and Lindsey (2010), we assume that the number of ESOs granted to non-executive managers is equal to one-tenth of the total ESOs awarded to the second through fifth highest-paid executives. As ExecuComp stopped reporting the percentage of ESOs granted to an executive (*PCTTOTOPT*) since 2006, we use the number of options granted by a firm (*OPTGR*) from Compustat as the number of total ESOs granted by a firm thereafter. Data source: Compustat, ExecuComp.
INSTITUTION (DEDICATED)	The ownership of dedicated institutional investors. Dedicated institutional investors are identified following Bushee (1998). This variable is ranked into deciles by year. Data source: Thomson Reuters Institutional Holdings (13F) and Bushee (1998).
INSTITUTION (QUASI-INDEXER)	The ownership of quasi-indexer institutional investors. Quasi-indexer institutional investors are identified following Bushee (1998). This variable is ranked into deciles by year. Data source: Thomson Reuters Institutional Holdings (13F) and Bushee (1998).
INSTITUTION (TRANSIENT)	The ownership of transient institutional investors. Transient institutional investors are identified following Bushee (1998). This variable is ranked into deciles by year. Data source: Thomson Reuters Institutional Holdings (13F) and Bushee (1998).

Table 1. Sample Selection

This table reports the number of observations at each step of the sample screening process. The sample period is from 1992 to 2022.

Description	**Observations**
CEOs with LinkedIn profiles	3,017
Less CEOs with missing profile pictures	(1,106)
CEOs with LinkedIn profile pictures	1,911
Constructing firm-year observations by matching with ExecuComp	16,768
Less observations with missing firm fundamentals	(3,968)
Less observations with missing CEO characteristics	(619)
Less observations with missing dependent variables	(1,534)
Less singleton observations due to year and firm fixed effects	(93)
Final Sample	**10,554**

Table 2. Sample Distribution

This table reports the year and industry distributions. Panel A reports the distribution by year. Panel B reports the distribution by industry (two-digit SIC), with the twenty most represented industries listed. The sample period is from 1992 to 2022.

Panel A. Distribution of Observations by Year

Year	Obs.	Percent	Year	Obs.	Percent
1992	30	0.28	2008	430	4.07
1993	80	0.76	2009	434	4.11
1994	116	1.10	2010	440	4.17
1995	136	1.29	2011	450	4.26
1996	141	1.34	2012	447	4.24
1997	156	1.48	2013	473	4.48
1998	179	1.70	2014	494	4.68
1999	196	1.86	2015	510	4.83
2000	225	2.13	2016	516	4.89
2001	235	2.23	2017	514	4.87
2002	260	2.46	2018	524	4.96
2003	269	2.55	2019	522	4.95
2004	288	2.73	2020	524	4.96
2005	293	2.78	2021	506	4.79
2006	317	3.00	2022	434	4.11
2007	415	3.93	**Total**	**10,554**	**100.00**

Panel B. Distribution of Observations by Industry (Top 20)

SIC	Industry	Obs.	Percent
73	Business Services	1,306	12.37
28	Chemical and Allied Products	864	8.19
36	Electronic and Other Electric Equipment	780	7.39
35	Industrial Machinery and Equipment	735	6.96
38	Instruments and Related Products	633	6.00
49	Electric, Gas, And Sanitary Services	624	5.91
13	Oil and Gas Extraction	390	3.70
60	Depository Institutions	356	3.37
50	Wholesale Trade and Durable Goods	330	3.13
58	Eating and Drinking Places	259	2.45
20	Food and Kindred Products	256	2.43
62	Security and Commodity Brokers, Dealers, Exchanges, And Services	205	1.94
37	Transportation Equipment	198	1.88
56	Apparel and Accessory Stores.	189	1.79
80	Health Services	180	1.71
48	Communications	176	1.67
63	Insurance Carriers	169	1.60
67	Holding and Other Investment Offices	164	1.55
87	Engineering, Accounting, Research, Management and Related Services	160	1.52
34	Fabricated Metal Products	152	1.44

Table 3. Descriptive Statistics

This table reports descriptive statistics. Panel A shows the distribution of all variables. Panel B shows the Pearson correlations of the variables in the main analysis. Summary statistics are reported at the firm-year level. All variable definitions are listed in Appendix 1. The sample period for the main analysis is from 1992 to 2022. In Panel B, * indicates significance at the 10% level.

Panel A. Variable Distributions

	N	Mean	SD	P10	P25	P50	P75	P90
PATENTS	10,554	17.003	67.735	0.000	0.000	0.000	3.000	30.000
FORWARD CITATIONS	10,554	204.684	1566.50	0.000	0.000	0.000	6.000	155.00
CITATIONS PER PATENT	10,554	4.981	21.148	0.000	0.000	0.000	1.543	12.000
$VALUEN	10,554	8.071	24.773	0.000	0.000	0.000	4.636	20.234
$VALUER	10,554	19.835	60.643	0.000	0.000	0.000	10.938	49.033
NOVELTY	10,554	0.353	0.742	0.000	0.000	0.000	0.484	1.105
SCOPE	10,554	0.081	0.155	0.000	0.000	0.000	0.102	0.328
ORIGINALITY	10,554	0.135	0.252	0.000	0.000	0.000	0.000	0.617
CEO TRUST	10,554	0.078	0.476	-0.603	-0.263	0.140	0.445	0.658
SIZE	10,554	7.661	1.687	5.591	6.454	7.563	8.784	9.864
RD	10,554	0.031	0.060	0.000	0.000	0.000	0.035	0.105
FIRM AGE	10,554	2.938	0.801	1.792	2.485	3.045	3.555	3.892
ROA	10,554	0.121	0.101	0.022	0.075	0.119	0.170	0.232
PPE	10,554	0.254	0.238	0.029	0.071	0.163	0.373	0.664
LEVERAGE	10,554	0.247	0.203	0.000	0.071	0.230	0.369	0.515
CAPEX	10,554	0.045	0.047	0.007	0.015	0.031	0.059	0.098
TOBIN Q	10,554	2.772	2.699	1.014	1.304	1.889	3.074	5.430
KZ INDEX	10,554	-9.517	22.547	-24.313	-8.926	-2.152	0.241	1.228
HHI	10,554	0.258	0.201	0.067	0.102	0.201	0.345	0.547
HHI SQUARED	10,554	0.107	0.172	0.004	0.010	0.041	0.119	0.299
INSTITUTION	10,554	0.663	0.337	0.000	0.513	0.770	0.908	0.984
ILLIQUIDITY	10,554	0.029	0.184	0.000	0.000	0.001	0.005	0.023
FEMALE	10,554	0.050	0.217	0.000	0.000	0.000	0.000	0.000
AGE	10,554	55.273	6.965	46.000	51.000	55.000	60.000	64.000
TENURE	10,554	7.833	6.716	2.000	3.000	6.000	11.000	17.000
EDU	10,554	1.452	0.900	0.000	1.000	2.000	2.000	2.000
SALARY	10,554	0.758	0.340	0.351	0.500	0.734	0.981	1.200
BONUS	10,554	1.126	1.362	0.000	0.242	0.707	1.493	2.730
EQUITY HOLDINGS	10,554	53.223	170.304	0.830	3.405	10.867	34.354	100.056
NEW OPTION PPS	10,554	0.022	0.056	0.000	0.000	0.000	0.020	0.067
NEW STOCK PPS	10,554	0.009	0.021	0.000	0.000	0.000	0.011	0.028
DELTA	10,554	0.578	1.898	0.000	0.043	0.146	0.449	1.174

VEGA	10,554	0.103	0.208	0.000	0.000	0.028	0.109	0.279
ABILITY	7,848	-0.001	0.147	-0.137	-0.087	-0.035	0.041	0.182
STEM	7,848	0.459	0.498	0.000	0.000	0.000	1.000	1.000
SCIENCE SKILLS	7,848	0.023	0.149	0.000	0.000	0.000	0.000	0.000
TECH SKILLS	7,848	0.083	0.276	0.000	0.000	0.000	0.000	0.000
OVERALL RATING	2,751	3.256	0.637	2.380	2.816	3.293	3.733	4.065
SENIOR LEADERSHIP	2,751	2.860	0.664	1.977	2.378	2.860	3.307	3.719
BUSINESS OUTLOOK	2,751	0.250	0.383	-0.296	0.000	0.291	0.538	0.722
BEST COMPANY	9,974	0.027	0.161	0.000	0.000	0.000	0.000	0.000
FOR VOTES	8,681	0.947	0.053	0.884	0.935	0.964	0.980	0.989
AGAINST VOTES	8,681	0.051	0.056	0.010	0.018	0.033	0.062	0.110
FINANCING CASH FLOW	10,554	0.082	0.680	-0.305	-0.113	0.000	0.166	0.566
DEBT ISSUANCE	10,554	0.136	0.636	-0.195	-0.033	0.003	0.198	0.570
CEO TERMINATION	10,554	0.142	0.349	0.000	0.000	0.000	0.000	1.000
FORECAST SPEED	4,698	0.447	0.211	0.200	0.333	0.500	0.500	0.500
FORECAST DISPERSION	9,849	0.055	0.095	0.007	0.013	0.026	0.057	0.121
SD FORWARD CITATIONS	3,114	5.772	12.001	0.577	1.311	3.005	6.364	12.228
PATENT to RD	4,647	481.361	2917.683	0.000	0.000	19.005	160.489	671.675

Panel B. Pearson Correlations

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) *Ln(PATENTS)*	1.00														
(2) *Ln(FORWARD CITATIONS))*	0.88*	1.00													
(3) *CEO TRUST*	0.05*	0.02*	1.00												
(4) *SIZE*	0.20*	0.09*	0.08*	1.00											
(5) *RD*	0.38*	0.38*	0.02*	-0.30*	1.00										
(6) *FIRM AGE*	0.05*	-0.03*	-0.03*	0.35*	-0.18*	1.00									
(7) *ROA*	0.07*	0.06*	0.01	0.02*	-0.22*	0.02*	1.00								
(8) *PPE*	-0.20*	-0.18*	-0.01	0.11*	-0.27*	0.16*	0.11*	1.00							
(9) *LEVERAGE*	-0.09*	-0.14*	0.07*	0.28*	-0.21*	0.10*	0.01	0.30*	1.00						
(10) *CAPEX*	-0.09*	-0.04*	-0.02*	-0.08*	-0.11*	-0.06*	0.23*	0.67*	0.07*	1.00					
(11) *TOBIN Q*	0.17*	0.15*	0.06*	-0.13*	0.28*	-0.16*	0.30*	-0.16*	-0.09*	0.01	1.00				
(12) *KZ INDEX*	0.00	0.02	-0.05*	-0.06*	-0.01	0.05*	0.02*	0.36*	0.14*	0.27*	-0.11*	1.00			
(13) *HHI*	0.08*	0.05*	-0.03*	-0.03*	-0.09*	0.13*	0.06*	-0.07*	0.02*	-0.06*	-0.02*	0.10*	1.00		
(14) *HHI SQUARED*	0.07*	0.04*	-0.03*	-0.01	-0.08*	0.13*	0.05*	-0.04*	0.03*	-0.05*	-0.01	0.08*	0.94*	1.00	
(15) *INSTITUTION*	0.07*	0.00	0.03*	0.07*	0.03*	0.04*	0.08*	-0.11*	0.02*	-0.11*	0.05*	0.00	0.09*	0.07*	1.00
(16) *ILLIQUIDITY*	-0.06*	-0.05*	-0.03*	-0.22*	0.03*	-0.03*	-0.13*	-0.03*	-0.03*	-0.03*	-0.05*	0.00	0.03*	0.03*	-0.14*
(17) *FEMALE*	-0.05*	-0.07*	0.07*	0.02*	-0.05*	-0.01	0.03*	0.02*	0.03*	-0.01	0.01	0.01	0.02*	0.02*	0.07*
(18) *AGE*	-0.04*	-0.07*	0.00	0.18*	-0.12*	0.20*	0.00	0.06*	0.08*	-0.01	-0.09*	0.00	0.05*	0.05*	0.04*
(19) *TENURE*	-0.03*	-0.03*	0.00	-0.04*	0.02*	0.00	0.02*	-0.02*	-0.06*	0.00	0.01	-0.02*	-0.06*	-0.06*	0.04*
(20) *EDU*	0.06*	0.05*	0.04*	0.00	0.13*	0.04*	-0.04*	-0.01	0.02*	-0.02*	-0.02*	-0.02*	-0.04*	-0.05*	0.07*

(21) *SALARY*	0.12*	0.00	0.05*	0.66*	-0.22*	0.33*	0.09*	0.05*	0.29*	-0.09*	-0.04*	0.00	0.07*	0.05*	0.18*
(22) *BONUS*	0.12*	0.02*	0.04*	0.54*	-0.15*	0.23*	0.11*	-0.05*	0.16*	-0.10*	0.03*	-0.11*	0.03*	0.03*	0.11*
(23) *EQUITY HOLDINGS*	0.14*	0.12*	-0.01	0.14*	0.02*	-0.07*	0.10*	-0.06*	-0.05*	0.03*	0.27*	-0.04*	-0.03*	-0.04*	-0.03*
(24) *NEW OPTION PPS*	0.24*	0.26*	0.03*	0.21*	0.06*	0.02*	0.11*	-0.04*	-0.02*	0.01	0.21*	0.01	-0.02*	-0.03*	-0.03*
(25) *NEW STOCK PPS*	0.13*	0.05*	0.02*	0.24*	0.00	0.09*	0.02*	-0.02*	0.08*	-0.06*	0.06*	0.00	0.02*	0.02	0.11*
(26) *DELTA*	0.14*	0.14*	0.00	0.15*	0.01	-0.04*	0.10*	-0.06*	-0.05*	0.02*	0.26*	-0.05*	-0.02*	-0.03*	-0.02*
(27) *VEGA*	0.28*	0.26*	0.08*	0.36*	0.03*	0.13*	0.11*	-0.05*	0.03*	-0.03*	0.14*	0.00	0.01	0.00	0.03*
(28) *ABILITY*	0.17*	0.17*	0.05*	0.12*	0.16*	0.00	0.20*	-0.07*	-0.09*	0.05*	0.21*	-0.20*	-0.08*	-0.06*	-0.01
(29) *STEM*	0.15*	0.13*	0.05*	-0.01	0.12*	0.04*	0.00	0.00	-0.01	0.00	-0.01	0.02*	0.01	0.00	0.09*
(30) *SCIENCE SKILLS*	0.10*	0.09*	0.01	-0.03*	0.20*	-0.04*	-0.02*	-0.06*	-0.04*	-0.04*	0.10*	-0.02*	-0.05*	-0.04*	-0.02
(31) *TECH SKILLS*	0.10*	0.04*	0.03*	0.06*	0.06*	0.04*	-0.01	-0.06*	0.03*	-0.04*	0.05*	0.02	0.04*	0.04*	0.05*

Variable	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**	**(23)**	**(24)**	**(25)**	**(26)**	**(27)**	**(28)**	**(29)**	**(30)**
(16) *ILLIQUIDITY*	1.00														
(17) *FEMALE*	0.01	1.00													
(18) *AGE*	-0.03*	-0.03*	1.00												
(19) *TENURE*	-0.01	-0.07*	0.39*	1.00											
(20) *EDU*	-0.02*	0.04*	0.00	0.00	1.00										
(21) *SALARY*	-0.15*	0.07*	0.24*	0.01	-0.01	1.00									
(22) *BONUS*	-0.10*	0.04*	0.15*	0.02*	0.01	0.58*	1.00								
(23) *EQUITY HOLDINGS*	-0.04*	-0.03*	0.05*	0.20*	-0.02	0.02*	0.13*	1.00							
(24) *NEW OPTION PPS*	-0.05*	-0.03*	-0.02*	-0.02*	0.01	0.15*	0.17*	0.26*	1.00						
(25) *NEW STOCK PPS*	-0.06*	0.01	0.03*	-0.01	0.01	0.24*	0.22*	0.01	0.04*	1.00					
(26) *DELTA*	-0.04*	-0.02*	0.03*	0.15*	-0.01	0.07*	0.17*	0.80*	0.33*	0.01	1.00				
(27) *VEGA*	-0.07*	-0.02*	0.04*	0.02*	0.01	0.32*	0.27*	0.24*	0.54*	0.05*	0.38*	1.00			
(28) *ABILITY*	-0.03*	-0.02*	-0.07*	-0.02*	0.02*	0.07*	0.12*	0.09*	0.18*	0.02*	0.13*	0.22*	1.00		
(29) *STEM*	-0.06*	0.02*	-0.01	-0.04*	0.12*	-0.01	0.01	-0.02*	-0.02*	0.02*	-0.02*	-0.04*	-0.01	1.00	
(30) *SCIENCE SKILLS*	0.00	0.04*	0.01	0.02	0.08*	-0.02*	-0.01	0.02*	0.01	0.02*	0.00	0.02*	0.08*	0.10*	1.00
(31) *TECH SKILLS*	-0.02*	0.03*	-0.04*	-0.06*	0.06*	0.05*	0.04*	0.04*	0.01	0.05*	0.02*	0.02	0.00	0.10*	0.06*

Table 4. Evaluation of CEO Perceived Trustworthiness

This table reports the evaluation tests of CEO perceived trustworthiness. Panel A shows the impact of CEO perceived trustworthiness on employees' trust. In columns (1)-(3), the dependent variables are the employees' ratings for the firm, senior leadership, and business outlook. In column (4), the dependent variable is an indicator variable equal to one if a firm is listed on *Fortune* magazine's "100 Best Companies to Work For", and zero otherwise. The set of control variables is defined in Appendix 1. Columns (5)-(8) repeat the regressions by replacing *CEO TRUST* with $CEO\ TRUST_{RESIDUAL}$, which is the residual of *CEO TRUST* after partialing out all CEO related control variables. Panel B shows the impact of CEO perceived trustworthiness on shareholders' trust. In columns (1) and (2), the dependent variables are the average percentage of for and against votes over management-proposed agendas at annual shareholders' meetings, respectively. The percentage of "for" ("against") votes is calculated as the number of "for" ("against") votes divided by the total number of "for", "abstain", and "against" votes. The key independent variable, *CEO TRUST*, is the trustworthiness score of the CEO. In columns (3) and (4), the dependent variables are the cash flow of financing activities and the debt issuance. For columns (1)-(4), the key independent variable, *CEO TRUST*, is the trustworthiness score of the CEO. Columns (5) and (6) report the subsample analysis based on whether a firm's CEO has high perceived trustworthiness. The dependent variable is an indicator variable equal to one if a firm's CEO is terminated in the following year, and zero otherwise. The key independent variable is an indicator equal to one if the firm has low ROA. A firm is defined to have low (high) CEO perceived trustworthiness or ROA if their measures are (not) in the bottom quintile compared with contemporaneous two-digit SIC peers. Reflecting the signed nature of the prediction, the test for the difference in coefficients is one-sided. Columns (7)-(12) repeat the regressions by replacing *CEO TRUST* with $CEO\ TRUST_{RESIDUAL}$. Panel C shows the impact of CEO perceived trustworthiness on stock analysts' trust. In column (1), the dependent variable *FORECAST SPEED* is calculated as the inverse of the median number of days for stock analysts to revise their earnings forecasts after earnings conference calls. Column (2) repeats the regressions by replacing *CEO TRUST* with $CEO\ TRUST_{RESIDUAL}$. Unless otherwise noted, all regressions include year fixed effects and firm fixed effects, and the *t*-statistics (presented in parentheses) are calculated based on robust standard errors. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Panel A. CEO Perceived Trustworthiness and Employees' Trust

	(1) *OVERALL RATING*	(2) *SENIOR LEADERSHIP*	(3) *BUSINESS OUTLOOK*	(4) *BEST COMPANY*
CEO TRUST	0.133**	0.126*	0.111**	0.007**
	(2.03)	(1.68)	(2.52)	(2.11)
Controls, Firm FE, and Year FE	YES	YES	YES	Year FE
Adjusted R^2	0.548	0.514	0.458	0.092
N	2,751	2,751	2,751	9,974

	(5) *OVERALL RATING*	(6) *SENIOR LEADERSHIP*	(7) *BUSINESS OUTLOOK*	(8) *BEST COMPANY*
$CEO\ TRUST_{RESIDUAL}$	0.136**	0.132*	0.109**	0.006**
	(2.01)	(1.72)	(2.40)	(2.00)
Controls, Firm FE, and Year FE	YES	YES	YES	Year FE
Adjusted R^2	0.548	0.514	0.458	0.092
N	2,751	2,751	2,751	9,974

[continued on next page]

Panel B. CEO Perceived Trustworthiness and Shareholders' Trust

	(1) *FOR VOTES*	(2) *AGAINST VOTES*	(3) *FINANCING CASH FLOW*	(4) *DEBT ISSUANCE*	(5) *CEO TERMINATION*	(6) *CEO TERMINATION*
Subsample =					***Low CEO TRUST***	***High CEO TRUST***
CEO TRUST	0.016***	-0.017***	0.149**	0.170***		
	(3.82)	(-3.94)	(2.28)	(3.08)		
LOW ROA					0.025**	0.002
					(2.02)	(0.27)
Equal *LOW ROA? (F-stat)*					2.83**	
					(p=0.05)	
Controls, Firm FE, and Year FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.322	0.321	0.163	0.144	0.091	0.035
N	8,681	8,681	10,554	10,554	2,779	7,775

	(7) *FOR VOTES*	(8) *AGAINST VOTES*	(9) *FINANCING CASH FLOW*	(10) *DEBT ISSUANCE*	(11) *CEO TERMINATION*	(12) *CEO TERMINATION*
Subsample =					***Low $CEO\ TRUST_{RESIDUAL}$***	***High $CEO\ TRUST_{RESIDUAL}$***
$CEO\ TRUST_{RESIDUAL}$	0.017***	-0.018***	0.137**	0.164***		
	(3.88)	(-3.99)	(2.05)	(2.91)		
LOW ROA					0.024*	0.000
					(1.89)	(0.00)
Equal *LOW ROA? (F-stat)*					2.89**	
					(p=0.04)	
Controls, Firm FE, and Year FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.322	0.321	0.163	0.144	0.097	0.031
N	8,681	8,681	10,554	10,554	2,737	7,721

Panel C. CEO Perceived Trustworthiness and Stock Analysts' Trust

	(1) *FORECAST SPEED*	(2) *FORECAST SPEED*
CEO TRUST	0.059**	
	(2.14)	
$CEO\ TRUST_{RESIDUAL}$		0.061**
		(2.15)
Controls, Firm FE, and Year FE	YES	YES
Adjusted R^2	0.425	0.425
N	4,698	4,698

Table 5. Main Results

This table reports the regression results of the baseline model. In columns (1)-(3) of Panel A, the dependent variable *Ln(PATENTS)* is the natural logarithm of one plus the number of patents a firm filed in year $t + 1$. In columns (4)-(6) of Panel A, the dependent variable *Ln(FORWARD CITATIONS)* is the natural logarithm of one plus the number of forward citations received by a firm's patents in year $t + 1$. Columns (1)-(3) and (4)-(6) show the specifications with (i) *CEO TRUST* only, (ii) *CEO TRUST* and firm fundamental variables, and (iii) *CEO TRUST*, firm fundamental variables, and CEO characteristics, respectively. In Panel B, the dependent variables include: *Ln(CITATIONS PER PATENT)* is the natural logarithm of one plus the average number of citations received by a firm's filed patents in year $t + 1$; *Ln($VALUER)* is the natural logarithm of one plus the average real dollar value of a firm's filed patents in year $t + 1$; *Ln($VALUEN)* is the natural logarithm of one plus the average nominal dollar value of a firm's filed patents in year $t + 1$; *Ln(NOVELTY)* is the natural logarithm one plus the average patent novelty of a firm's filed patents in year $t + 1$; *Ln(SCOPE)* is the natural logarithm of one plus the average patent scope of a firm's filed patents in year $t + 1$; *Ln(ORIGINALITY)* is the natural logarithm of one plus the average patent originality of a firm's filed patents in year $t + 1$. The patent citations and dollar values are retrieved from the Kogan et al. (2017) database. The novelty, scope, and originality of each patent are computed following past studies on innovation (Trajtenberg et al. 1997; Seru 2014; Dong et al. 2021; Tian et al. 2025). The key independent variable, *CEO TRUST*, is the trustworthiness score of the CEO. Panel C repeats the regressions in Panels A and B by replacing *CEO TRUST* with *CEO TRUST$_{RESIDUAL}$*, defined as the residual from regressing *CEO TRUST* on all CEO-level control variables. The control variables are defined in detail in Appendix 1. All regressions include year fixed effects and firm fixed effects. The sample period is from 1992 to 2022. The t-statistics (presented in parentheses) are clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Panel A. Innovation Performance

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln(PATENTS)	***Ln(PATENTS)***	***Ln(PATENTS)***	***Ln(FORWARD CITATIONS)***	***Ln(FORWARD CITATIONS)***	***Ln(FORWARD CITATIONS)***
CEO TRUST	0.232***	0.233***	0.246***	0.536***	0.515***	0.545***
	(3.34)	(3.24)	(3.48)	(3.67)	(3.47)	(3.68)
SIZE		0.202***	0.191***		0.165**	0.158**
		(4.71)	(4.75)		(2.29)	(2.26)
RD		1.262***	1.237***		1.742*	1.723*
		(2.68)	(2.62)		(1.91)	(1.91)
FIRM AGE		-0.003	-0.007		-0.051	-0.058
		(-0.04)	(-0.11)		(-0.40)	(-0.46)
ROA		-0.025	-0.024		-0.364	-0.343
		(-0.16)	(-0.16)		(-1.22)	(-1.14)
PPE		0.512***	0.525***		1.000***	1.003***
		(2.85)	(2.97)		(2.94)	(2.94)
LEVERAGE		-0.113	-0.104		-0.310	-0.299
		(-1.27)	(-1.17)		(-1.62)	(-1.57)
CAPEX		0.073	0.107		-0.481	-0.420
		(0.26)	(0.39)		(-0.87)	(-0.76)
TOBIN Q		0.014**	0.012*		0.024*	0.020
		(2.31)	(1.80)		(1.89)	(1.58)

KZ INDEX		-0.000	-0.000		0.001	0.001
		(-0.03)	(-0.10)		(0.89)	(0.85)
HHI		0.804	0.697		1.523	1.385
		(1.09)	(1.11)		(1.24)	(1.27)
HHI SQUARED		-0.806	-0.680		-1.715	-1.549
		(-0.91)	(-0.94)		(-1.17)	(-1.21)
INSTITUTION		-0.048	-0.051		0.134	0.127
		(-0.76)	(-0.81)		(1.23)	(1.17)
ILLIQUIDITY		0.001	-0.007		-0.054	-0.061
		(0.03)	(-0.16)		(-0.58)	(-0.66)
FEMALE			0.050			0.065
			(0.74)			(1.00)
AGE			0.000			0.003
			(0.03)			(0.98)
TENURE			0.001			-0.003
			(0.45)			(-0.80)
EDU			-0.033			-0.022
			(-0.63)			(-0.55)
SALARY			-0.055			0.018
			(-0.73)			(0.27)
BONUS			0.005			0.006
			(0.51)			(0.53)
EQUITY HOLDINGS			0.000			-0.000
			(0.36)			(-0.93)
NEW OPTION PPS			0.389*			0.316
			(1.65)			(0.90)
NEW STOCK PPS			2.378**			0.558
			(2.38)			(0.87)
DELTA			-0.007			0.004
			(-0.65)			(0.38)
VEGA			0.039			-0.100
			(0.41)			(-1.05)
Year FE and Firm FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.860	0.863	0.864	0.787	0.789	0.790
N	10,554	10,554	10,554	10,554	10,554	10,554

[continued on next page]

Panel B. Additional Dimensions of Innovation Performance

	(1) *Ln(CITATIONS PER PATENT)*	(2) *Ln($VALUER)*	(3) *Ln($VALUEN)*	(4) *Ln(NOVELTY)*	(5) *Ln(SCOPE)*	(6) *Ln(ORIGINALITY)*
CEO TRUST	0.248***	0.777*	0.805*	0.076***	0.020**	0.034***
	(3.00)	(1.93)	(1.88)	(2.94)	(2.22)	(2.73)
SIZE	0.020	0.894***	0.950***	0.012	0.007*	0.020***
	(0.51)	(4.49)	(4.53)	(1.13)	(1.89)	(3.69)
RD	0.475	5.784**	6.071**	-0.089	0.104*	0.182**
	(0.96)	(2.22)	(2.20)	(-0.58)	(1.65)	(2.33)
FIRM AGE	-0.087	-0.496	-0.532	-0.011	0.004	0.001
	(-1.24)	(-1.43)	(-1.45)	(-0.61)	(0.46)	(0.15)
ROA	-0.144	0.631	0.706	0.014	-0.040**	-0.007
	(-0.82)	(0.75)	(0.80)	(0.27)	(-2.18)	(-0.25)
PPE	0.404*	1.642	1.715	0.041	0.065***	0.057**
	(1.92)	(1.61)	(1.60)	(0.76)	(2.90)	(2.03)
LEVERAGE	-0.132	-0.158	-0.151	-0.017	-0.007	-0.020
	(-1.14)	(-0.29)	(-0.26)	(-0.55)	(-0.56)	(-1.31)
CAPEX	-0.200	0.569	0.675	0.051	-0.019	-0.093*
	(-0.52)	(0.24)	(0.27)	(0.40)	(-0.45)	(-1.74)
TOBIN Q	0.016**	0.118***	0.123***	0.005**	0.002**	0.000
	(2.10)	(3.25)	(3.20)	(2.34)	(2.44)	(0.41)
KZ INDEX	0.001	0.002	0.001	0.000	0.000	0.000
	(1.41)	(0.34)	(0.30)	(0.23)	(1.14)	(0.49)
HHI	0.614	0.145	0.020	0.149	0.044	-0.024
	(1.03)	(0.07)	(0.01)	(1.11)	(0.74)	(-0.33)
HHI SQUARED	-0.727	0.236	0.377	-0.155	-0.066	0.010
	(-1.18)	(0.11)	(0.16)	(-1.25)	(-0.98)	(0.13)
INSTITUTION	0.100*	-0.028	-0.046	-0.003	0.006	0.004
	(1.69)	(-0.08)	(-0.13)	(-0.20)	(1.02)	(0.52)
ILLIQUIDITY	-0.048	-0.196	-0.213	-0.021	-0.004	-0.026*
	(-0.94)	(-0.82)	(-0.83)	(-1.36)	(-0.67)	(-1.87)
FEMALE	0.065	0.458	0.482	0.020	0.003	0.011
	(1.00)	(0.98)	(0.98)	(1.05)	(0.28)	(0.85)
AGE	0.003	-0.007	-0.008	0.001	0.000	0.000
	(0.98)	(-0.39)	(-0.43)	(1.12)	(0.07)	(0.67)
TENURE	-0.003	0.007	0.008	-0.001	-0.000	-0.000
	(-0.80)	(0.36)	(0.40)	(-0.88)	(-0.62)	(-0.48)
EDU	-0.022	-0.125	-0.135	-0.012	-0.005	-0.009
	(-0.55)	(-0.53)	(-0.55)	(-1.07)	(-1.25)	(-1.22)

SALARY	0.018	-0.005	-0.011	0.001	0.002	-0.007
	(0.27)	(-0.01)	(-0.02)	(0.06)	(0.30)	(-0.60)
BONUS	0.006	0.123*	0.132*	0.005	0.002*	0.002
	(0.53)	(1.87)	(1.89)	(1.45)	(1.83)	(1.23)
EQUITY HOLDINGS	-0.000	0.001	0.001	0.000	-0.000	0.000
	(-0.93)	(0.80)	(0.82)	(0.22)	(-0.87)	(1.19)
NEW OPTION PPS	0.316	-0.710	-0.805	0.018	0.022	0.045
	(0.90)	(-0.45)	(-0.49)	(0.17)	(0.70)	(1.29)
NEW STOCK PPS	0.558	8.464***	8.886***	0.241	0.050	0.085
	(0.87)	(2.76)	(2.76)	(1.57)	(0.69)	(0.80)
DELTA	0.004	-0.060	-0.065	-0.002	0.000	-0.001
	(0.38)	(-1.34)	(-1.37)	(-0.65)	(0.55)	(-0.99)
VEGA	-0.100	0.387	0.461	0.018	-0.010	0.006
	(-1.05)	(0.69)	(0.77)	(0.59)	(-1.05)	(0.40)
Year FE and Firm FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.657	0.703	0.703	0.607	0.550	0.620
N	10,554	10,554	10,554	10,554	10,554	10,554

Panel C. Using the Residual of *CEO TRUST*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ln(PATENTS)	***Ln(FORWARD CITATIONS)***	***Ln(CITATIONS PER PATENT)***	***Ln($VALUER)***	***Ln($VALUEN)***	***Ln(NOVELTY)***	***Ln(SCOPE)***	***Ln(ORIGINALITY)***
CEO TRUST$_{RESIDUAL}$	0.255***	0.573***	0.265***	0.832**	0.859**	0.078***	0.021**	0.037***
	(3.51)	(3.73)	(3.13)	(2.01)	(1.97)	(3.03)	(2.28)	(2.91)
Controls, Firm FE, and Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.864	0.790	0.657	0.703	0.703	0.607	0.550	0.620
N	10554	10554	10,554	10,554	10,554	10,554	10,554	10,554

Table 6. The Quasi-exogenous Shock of Corporate Financial Scandals

This table reports the effects of the quasi-exogenous shock of corporate financial scandals on corporate innovation. For each event of corporate financial scandal, we create a cohort of treated and control firms around the event window of 7 years (i.e., -3 to 3, including the event year $t = 0$). *POST* is an indicator for years of events and onward. *TREAT* is an indicator for treated firms. A firm is identified as a treated firm if it (i) does not have a scandal itself, (ii) operates in the same Core-based Statistical Area (CBSA) as the firm involves in a financial scandal, and (iii) is not a customer or supplier of the firm involves in a financial scandal. A firm is identified as a control firm if it operates in a CBSA with no financial scandal throughout the sample (i.e., never-treated). The treated firms are expected to have a comparable trust effect with the control firms before scandals but to experience an exogenous increase in the importance of trust afterward, which predicts a larger effect of *CEO TRUST* on corporate innovation. Corporate financial scandals are identified using the AAER (Accounting and Auditing Enforcement Releases) dataset. The dependent variables, *Ln(PATENTS)* and *Ln(FORWARD CITATIONS)*, are the natural logarithm of one plus the number of patents a firm filed and the natural logarithm of one plus the number of forward citations received by a firm's patents, respectively. All regressions include cohort-specific control variables, cohort-specific year times CBSA fixed effects, and cohort-specific firm fixed effects. In columns (1) and (3), the standalone terms of *TREAT*, *POST*, and *TREAT* × *POST* are absorbed by cohort-specific firm fixed effects and cohort-specific year times CBSA fixed effects. In the dynamic tests reported in columns (2) and (4), the year before the AAER release (i.e., $t = -1$) is used as the baseline, so its interactions (i.e., *CEO TRUST* × *TREAT* × *PRE_1*, *CEO TRUST* × *PRE_1*, and *TREAT* × *PRE_1*) are omitted because of multicollinearity. The set of control variables is defined in Appendix 1. The sample period is from 1992 to 2022. The *t*-statistics (presented in parentheses) are clustered at the cohort-firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Ln(PATENTS)	***Ln(PATENTS)***	***Ln(FORWARD CITATIONS)***	***Ln(FORWARD CITATIONS)***
CEO TRUST × TREAT × POST	0.212***		0.291**	
	(3.25)		(2.41)	
CEO TRUST × TREAT × PRE_3		-0.019		0.010
		(-0.24)		(0.06)
CEO TRUST × TREAT × PRE_2		-0.038		-0.162
		(-0.64)		(-1.20)
CEO TRUST × TREAT × POST_0		0.071		0.044
		(1.29)		(0.34)
CEO TRUST × TREAT × POST_1		0.200***		0.208
		(2.93)		(1.41)
CEO TRUST × TREAT × POST_2		0.261***		0.382**
		(2.94)		(2.19)
CEO TRUST × TREAT × POST_3		0.328***		0.443**
		(3.03)		(2.17)
CEO TRUST × POST	0.042***		0.007	
	(2.64)		(0.24)	
CEO TRUST × PRE_3		-0.029		-0.001
		(-1.50)		(-0.01)
CEO TRUST × PRE_2		-0.012		0.007
		(-0.70)		(0.19)
CEO TRUST × POST_0		0.006		0.000
		(0.33)		(0.01)
CEO TRUST × POST_1		0.023		0.022
		(1.15)		(0.55)
CEO TRUST × POST_2		0.050**		0.020
		(2.24)		(0.46)
CEO TRUST × POST_3		0.059**		-0.002
		(2.32)		(-0.05)
CEO TRUST × TREAT	0.137	0.137	0.441	0.469
	(0.54)	(0.55)	(1.07)	(1.16)

CEO TRUST	0.059	0.067	0.036	0.034
	(1.44)	(1.58)	(0.50)	(0.46)
Cohort FE × (Controls, Firm FE, and Year × CBSA FE)	YES	YES	YES	YES
Adjusted R^2	0.924	0.924	0.864	0.864
N	37,436	37,436	37,436	37,436

Table 7. Innovation Riskiness and Efficiency

This table reports the regression results on mechanisms of innovation riskiness and efficiency. In columns (1)-(3), the dependent variable *Ln(SD FORWARD CITATIONS)* is the natural logarithm of one plus the standard deviation of the number of five-year forward citations received by patents filed by a firm in year t + 1. In columns (4)-(6), the dependent variable *Ln(PATENTS to RD)* is the natural logarithm of one plus the number of patents filed by a firm in year t + 1 divided by the firm's five-year rolling R&D intensity. Columns (1)-(2) and (4)-(5) show the specifications without and with control variables. Columns (3) and (6) replace *CEO TRUST* with *CEO TRUST$_{RESIDUAL}$*, defined as the residual from regressing *CEO TRUST* on all CEO-level control variables. The regression samples in these tests are smaller than the main regression, as we need firms to have non-missing standard deviation of the number of five-year forward citations to compute innovation riskiness, and firms to have non-missing R&D to compute innovation efficiency. The control variables are defined in detail in Appendix 1. All regressions include year fixed effects and firm fixed effects. The sample period is from 1992 to 2022. The t-statistics (presented in parentheses) are clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1) ***Ln(SD FORWARD CITATIONS)***	(2) ***Ln(SD FORWARD CITATIONS)***	(3) ***Ln(SD FORWARD CITATIONS)***	(4) ***Ln(PATENTS to RD)***	(5) ***Ln(PATENTS to RD)***	(6) ***Ln(PATENTS to RD)***
CEO TRUST	0.324***	0.325***		0.427**	0.499***	
	(3.01)	(2.69)		(2.36)	(2.92)	
CEO TRUST$_{RESIDUAL}$			0.330***			0.529***
			(2.60)			(3.05)
Controls	NO	YES	YES	NO	YES	YES
Firm FE and Year FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.598	0.605	0.605	0.801	0.813	0.813
N	3,114	3,114	3,114	4,647	4,647	4,647

Table 8. Robustness Checks

This table shows robustness tests of the baseline result. Panel A shows the robustness with the inclusion of inherited trust inferred from the CEO's last name (Nguyen 2025). Panel B shows robustness using alternative dependent variables. Columns (1)-(3) use *arcsinh*(*PATENTS*), which is the inverse hyperbolic sine of the number of patents a firm files in year $t + 1$, *Ln(PATENTS*$_{t+1,\ t+3}$*)*, which is the natural logarithm of one plus the average number of patents a firm filed from year $t + 1$ to $t + 3$, and *PATENT INDICATOR*, which is an indicator equal to one if a firm filed patents in year $t + 1$, and zero otherwise, respectively. Columns (4)-(6) use *arcsinh*(*FORWARD CITATIONS*), which is the inverse hyperbolic sine of the number of forward citations received by a firm's patents in year $t + 1$, *Ln(FORWARD CITATIONS*$_{t+1,\ t+3}$*)*, which is the natural logarithm of one plus the average number of forward citations received by a firm's patents in year $t + 1$ to $t + 3$, and *FORWARD CITATIONS*, which is an indicator equal to one if a firm' patents in year $t + 1$ receives at least one forward citations, and zero otherwise, respectively. Panel C shows robustness using alternative specifications. Columns (1) and (4) use Poisson regression; columns (2) and (5) use negative binomial regression; columns (3) and (6) further include year times CBSA fixed effects. Panel D shows robustness using alternative subsamples. Columns (1)-(6) use a subsample of firms with non-zero patents filed in year *t*, a subsample before 2010, and a subsample after 2010, for dependent variables of *Ln(PATENTS)* and *Ln(FORWARD CITATIONS)*, respectively. Panel E shows robustness with additional control variables. Columns (1)-(8) include additional controls of CEO facial-to-height ratio (*FWHR*), CEO youthfulness/attractiveness (*YOAT*) and CEO dominance (*DOM*), CEO ability (*ABILITY*), and CEO education discipline and skills (*STEM*, *SCIENCE SKILLS*, *TECH SKILLS*), for dependent variables of *Ln(PATENTS)* and *Ln(FORWARD CITATIONS)*, respectively. The key independent variable, *CEO TRUST*, is the trustworthiness score of the CEO. The set of control variables is defined in Appendix 1. Unless otherwise specified, the sample period is from 1992 to 2022. The *t*-statistics (presented in parentheses) are clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Panel A. CEO Inherited Trust

	(1) *Ln(PATENTS)*	**(2)** *Ln(FORWARD CITATIONS)*
CEO TRUST	0.245***	0.553***
	(3.46)	(3.74)
CEO INHERITED TRUST	0.160	0.792
	(0.54)	(1.48)
Controls, Firm FE, and Year FE	YES	YES
Adjusted R^2	0.864	0.790
N	10,528	10,528

[continued on next page]

Panel B. Alternative Dependent Variables

	(1)	(2)	(3)	(4)	(5)	(6)
	arcsinh(PATENTS)	***Ln(PATENTS$_{t+1,t+3}$)***	***PATENT INDICATOR***	***arcsinh(FORWARD CITATIONS)***	***Ln(FORWARD CITATIONS$_{t+1,t+3}$)***	***FORWARD CITATION INDICATOR***
CEO TRUST	0.285***	0.248***	0.050*	0.606***	0.501***	0.084***
	(3.44)	(3.23)	(1.87)	(3.66)	(3.35)	(2.95)
Controls, Firm FE, and Year FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.861	0.870	0.696	0.783	0.812	0.658
N	10,544	10,554	10,554	10,554	10,554	10,554

Panel C. Alternative Specifications

	(1)	(2)	(3)	(4)	(5)	(6)
	PATENTS	***PATENTS***	***Ln(PATENTS)***	***FORWARD CITATIONS***	***FORWARD CITATIONS***	***Ln(FORWARD CITATIONS)***
Specification =	***Poisson***	***Negative Binomial***	***OLS***	***Poisson***	***Negative Binomial***	***OLS***
CEO TRUST	0.616***	0.538***	0.211***	1.057***	0.967***	0.395***
	(2.61)	(2.97)	(2.68)	(2.95)	(3.38)	(2.76)
Controls, Firm FE, and Year FE	YES	YES	YES	YES	YES	YES
Year × CBSA FE	NO	NO	YES	NO	NO	YES
Pseudo R^2	0.920	0.375	0.870	0.943	0.254	0.807
N	6,173	10,554	9,296	5,526	10,554	9,296

Panel D. Alternative Subsamples

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln(PATENTS)	***Ln(PATENTS)***	***Ln(PATENTS)***	***Ln(FORWARD CITATIONS)***	***Ln(FORWARD CITATIONS)***	***Ln(FORWARD CITATIONS)***
Subsample =	***PATENT>0***	***Before 2010***	***After 2010***	***FORWARD CITATIONS > 0***	***Before 2010***	***After 2010***
CEO TRUST	0.476***	0.253*	0.252**	0.968***	0.775**	0.369**
	(3.13)	(1.77)	(2.44)	(4.00)	(2.34)	(2.40)
Equal *CEO TRUST?* (*F*-stat)		0.00 (p=0.99)			1.26 (p=0.26)	
Controls, Firm FE, and Year FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.829	0.904	0.858	0.787	0.843	0.744
N	4,005	4,640	5,914	3,569	4,640	5,914

[continued on next page]

Panel E. Additional Control Variables

	(1) *Ln(PATENTS)*	(2) *Ln(PATENTS)*	(3) *Ln(PATENTS)*	(4) *Ln(PATENTS)*
CEO TRUST	0.233***	0.268***	0.224***	0.246***
	(3.27)	(3.63)	(2.77)	(2.88)
FWHR	-0.005			-0.004
	(-1.31)			(-0.87)
YOAT		0.108		0.134
		(0.80)		(0.80)
DOM		-0.014		-0.012
		(-0.10)		(-0.08)
ABILITY			0.058	0.062
			(0.59)	(0.63)
STEM			0.066	0.067
			(1.53)	(1.56)
SCIENCE SKILLS			-0.058	-0.052
			(-0.47)	(-0.42)
TECH SKILLS			-0.181	-0.177
			(-1.58)	(-1.57)
Controls, Firm FE, and Year FE	YES	YES	YES	YES
Adjusted R^2	0.864	0.864	0.867	0.867
N	10,554	10,554	7,848	7,848

	(5) *Ln(FORWARD CITATIONS)*	(6) *Ln(FORWARD CITATIONS)*	(7) *Ln(FORWARD CITATIONS)*	(8) *Ln(FORWARD CITATIONS*
CEO TRUST	0.504***	0.595***	0.457***	0.458***
	(3.38)	(3.80)	(2.90)	(2.71)
FWHR	-0.018**			-0.025**
	(-2.01)			(-2.34)
YOAT		0.255		0.287
		(1.14)		(1.13)
DOM		0.167		0.253
		(0.69)		(1.00)
ABILITY			0.158	0.159
			(0.97)	(0.98)
STEM			0.123	0.121
			(1.48)	(1.44)
SCIENCE SKILLS			-0.119	-0.111
			(-0.44)	(-0.41)
TECH SKILLS			-0.415**	-0.404**
			(-2.01)	(-1.99)
Controls, Firm FE, and Year FE	YES	YES	YES	YES
Adjusted R^2	0.790	0.790	0.785	0.786
N	10,554	10,554	7,848	7,848

Table 9. Stakeholder Incentives and Analyst Beliefs

This table reports the regression results for tests on stakeholder incentives and analyst beliefs. In Panel A, the dependent variables include *Ln(PATENTS)*, which is the natural logarithm of one plus the number of patents a firm filed in year $t + 1$, and *Ln(FORWARD CITATIONS)*, which is the natural logarithm of one plus the number of forward citations received by a firm's patents in year $t + 1$. The key independent variables include *CEO TRUST*, which is the trustworthiness score of the CEO, and *EMPLOYEE STOCK OPTIONS*, which is the total number of stock options granted to its rank-and-file employees. The number of employee stock options is estimated using the methods proposed by Call et al. (2016) and Holderness et al. (2019). In Panel B, the dependent variable *RD* is the research and development (R&D) expenditure divided by the book value of total assets for a firm in year $t + 1$. The key independent variables include *CEO TRUST*, which is the trustworthiness score of the CEO, and *INSTITUTION*, which is the institutional ownership to total shares outstanding from Thomson Reuters Institutional Holdings (13F). Institutional ownership (*INSTITUTION*) is decomposed into dedicated, quasi-indexer, and transient institutional ownership (denoted as *DEDICATED, QUASI-INDEXER,* and *TRANSIENT*, respectively) following Bushee (1998). To mitigate the influence of extreme values on the estimation results, the institutional ownership variables in this test are ranked into deciles by year. In Panel C, the dependent variable is the dispersion of analyst earnings forecasts, *FORECAST DISPERSION*, which is calculated as the standard deviation of the latest earnings forecast issued by all analysts covering a firm. All regressions include year fixed effects and firm fixed effects. The set of control variables is defined in Appendix 1. The sample period is from 1992 to 2022. The *t*-statistics (presented in parentheses) are clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Panel A. Employee Motivation

	(1) *Ln(PATENTS)*	(2) *Ln(FORWARD CITATIONS)*
CEO TRUST × EMPLOYEE STOCK OPTIONS	0.010***	0.029***
	(2.75)	(3.68)
EMPLOYEE STOCK OPTIONS	0.005**	0.012**
	(2.12)	(2.48)
CEO TRUST	0.236***	0.517***
	(3.32)	(3.50)
Controls, Firm FE, and Year FE	YES	YES
Adjusted R^2	0.864	0.790
N	10,554	10,554

[continued on next page]

Panel B. Institutional Investors' Support

	(1) *RD*	(2) *RD*
CEO TRUST × INSTITUTION	0.056**	
	(2.06)	
CEO TRUST × INSTITUTION (DEDICATED)		0.044**
		(2.13)
CEO TRUST × INSTITUTION (QUASI-INDEXER)		0.033
		(1.15)
CEO TRUST × INSTITUTION (TRANSIENT)		0.089***
		(3.23)
INSTITUTION	-0.010	
	(-0.43)	
INSTITUTION (DEDICATED)		0.029*
		(1.88)
INSTITUTION (QUASI-INDEXER)		0.029*
		(1.87)
INSTITUTION (TRANSIENT)		0.010
		(0.77)
CEO TRUST	-0.242	-0.836**
	(-1.09)	(-2.42)
Controls, Firm FE, and Year FE	YES	YES
Adjusted R^2	0.910	0.910
N	10,554	10,554

Panel C. Information Asymmetries of Financial Analysts

	(1) *FORECAST DISPERSION*
CEO TRUST	-0.028**
	(-2.39)
Controls, Firm FE, and Year FE	YES
Adjusted R^2	0.535
N	9,849

Table 10. Heterogeneous Effects of Trustworthiness

This table reports the subsample regression results based on CEO characteristics. Panel A shows the results using subsamples of internal and external CEO, while Panel B shows the results using subsamples of high and low CEO tenure. In columns (1) and (2) of Panels A and B, the dependent variable *Ln(PATENTS)* is the natural logarithm of one plus the number of patents a firm filed in year $t + 1$. In columns (3) and (4) of Panels A and B, the dependent variable *Ln(FORWARD CITATIONS)* is the natural logarithm of one plus the number of forward citations received by a firm's patents in year $t + 1$. The key independent variable, *CEO TRUST*, is the trustworthiness score of the CEO. In Panels A and B, columns (1) and (2) split the sample by CEO type of internal or external CEO. A CEO is defined to be external (internal) if the CEO is appointed from outside (inside) the firm; columns (3) and (4) split the sample by CEO tenure. A CEO is defined to have a high (low) tenure if the number of years that an externally appointed CEO has worked for a firm is above (below) the sample median. All regressions include year fixed effects and firm fixed effects. The set of control variables is defined in Appendix 1. Reflecting the signed nature of the prediction, the test for the difference in coefficients is one-sided. The sample period is from 1992 to 2022. The *t*-statistics (presented in parentheses) are clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Panel A. Internal and External CEO

	(1) *Ln(PATENTS)*	(2) *Ln(PATENTS)*	(3) *Ln(FORWARD CITATIONS)*	(4) *Ln(FORWARD CITATIONS)*
Subsample =	***Internal CEO***	***External CEO***	***Internal CEO***	***External CEO***
CEO TRUST	0.145 (1.55)	0.383*** (3.11)	0.245 (1.06)	0.728*** (3.08)
Equal *CEO TRUST?* (*F*-stat)	2.30* (*p*=0.06)		2.15* (*p*=0.07)	
Controls, Firm FE, and Year FE	YES	YES	YES	YES
Adjusted R^2	0.886	0.863	0.808	0.814
N	5,693	4,861	5,693	4,861

Panel B. CEO Tenure

	(1) *Ln(PATENTS)*	(2) *Ln(PATENTS)*	(3) *Ln(FORWARD CITATIONS)*	(4) *Ln(FORWARD CITATIONS)*
Subsample =	***High CEO Tenure***	***Low CEO Tenure***	***High CEO Tenure***	***Low CEO Tenure***
CEO TRUST	0.105 (0.98)	0.394*** (3.17)	0.285 (1.25)	0.781*** (3.40)
Equal *CEO TRUST?* (*F*-stat)	2.58** (*p*=0.04)		2.38* (*p*=0.06)	
Controls, Firm FE, and Year FE	YES	YES	YES	YES
Adjusted R^2	0.877	0.877	0.800	0.835
N	7,898	2,656	7,898	2,656

Online Appendix

for

"CEO Trustworthiness and Corporate Innovation: The Face Value of CEOs"

- OA1. Technical Details on Measuring CEO Perceived Trustworthiness
- Figure OA1. Example of an Annotated Face
- Table OA1. List of 65 Facial Attributes and Calculation Descriptions
- Table OA2. Sample Comparison
- Table OA3. Full Table of CEO Perceived Trustworthiness and Employees' Trust
- Table OA4. Full Table of CEO Perceived Trustworthiness and Shareholders' Trust
- Table OA5. Full Table of CEO Perceived Trustworthiness and Analysts' Trust
- Table OA6. Full Table of Main Results Using $\textit{CEO TRUST}_{RESIDUAL}$
- Table OA7. Full Table of Innovation Riskiness and Efficiency

OA1. Technical Details on Measuring CEO Perceived Trustworthiness

To measure CEO perceived trustworthiness, we adopt a four-step procedure based on Vernon et al. (2014) and Peng et al. (2022). This procedure is detailed below.

Step 1: Collect photos

In the first step, we collect CEO photos from their LinkedIn profiles. We start with the ExecuComp database, which provides a list of 10,171 unique CEO names. We then manually search these names on Google and identify 3,017 LinkedIn profiles. To ensure matching accuracy, we apply the following criteria: (i) the first and last name of the individual on LinkedIn needs to match the CEO name in ExecuComp, (ii) the working experience of the individual on LinkedIn needs to match the CEO's working experience in ExecuComp, and (iii) the job title of the individual on LinkedIn needs to include at least one of the following terms: "CEO", "Chief Executive Officer", "Board", "Chief Manager", "Chairman", "President", "Principal", "Director", or "Chairperson". Among these identified profiles, 1,911 have publicly visible profile photos, and we collect them for analysis.[1]

Step 2: Annotate faces

In the second step, we annotate 68 fiducial points for each photo. We use the *dlib*'s facial landmark detector, which is trained on the iBUG dataset, to delineate 68 fiducial landmark points and obtain their corresponding coordinates.[2] See Online Appendix Figure OA1 for an illustration of annotated fiducial points.

Step 3: Compute facial attributes

In the third step, we use the coordinates of the 68 fiducial points to compute 65 facial attributes. The raw attributes are standardized following Vernon et al. (2014). Specifically, we apply a square-root transformation to area attributes, divide attributes by the average distance between all pairs of points outlining the head to account for photo size differences, and then scale all attributes linearly into the range [-1, 1]. The mapping of key fiducial points to facial attributes is adopted from Vernon et al. (2014) and is listed in Online Appendix Table OA1.

Step 4: Calculate trustworthiness

In the last step, we calculate the trustworthiness score for each CEO using the computed facial attributes. Following Vernon et al. (2014) and Peng et al. (2022), we linearly combine

[1] Among these collected profiles, 1,106 CEOs do not have public visible profile photos. Two possibilities for missing profile photos are: (i) the CEO has not uploaded a profile photo, and (ii) the CEO's privacy settings restrict public access to their profile photo (e.g., only visible to 1st-degree or 2nd-degree connections). Online Appendix Table OA2 shows that our LinkedIn-photo sample has similar characteristics to the LinkedIn sample without profile photos, which alleviates potential concerns on sample representativeness.

[2] The detector model is publicly available at https://ibug.doc.ic.ac.uk/.

significant facial attributes using the weights provided by Vernon et al. (2014). The resulting values are then linearly scaled into the range [-1,1]. The formula is as follows:

$$
\begin{aligned}
CEO\ TRUST \ = \ & 0.14 \times attribute3 + 0.17 \times attribute5 + 0.19 \times attribute6 \\
& - 0.16 \times attribute7 - 0.15 \times attribute8 - 0.26 \times attribute11 \\
& - 0.20 \times attribute12 - 0.30 \times attribute13 - 0.13 \times attribute14 \\
& - 0.31 \times attribute15 + 0.26 \times attribute16 + 0.45 \times attribute18 \\
& + 0.37 \times attribute19 - 0.37 \times attribute20 + 0.17 \times attribute21 \\
& + 0.18 \times attribute22 + 0.18 \times attribute24 + 0.69 \times attribute25 \\
& + 0.51 \times attribute26 - 0.24 \times attribute27 - 0.35 \times attribute28 \\
& + 0.73 \times attribute29 + 0.71 \times attribute30 + 0.36 \times attribute31 \\
& + 0.75 \times attribute32 + 0.22 \times attribute33 + 0.16 \times attribute34 \\
& - 0.23 \times attribute36 + 0.38 \times attribute39 - 0.39 \times attribute42 \\
& - 0.60 \times attribute47 - 0.13 \times attribute50 + 0.13 \times attribute52 \\
& + 0.12 \times attribute55 - 0.24 \times attribute59 - 0.15 \times attribute65
\end{aligned}
$$

Figure OA1. Example of an Annotated Face

This figure illustrates the 68 annotated key fiducial points. Specifically, #1 to #17 define the contour of the face, points #18 to #27 capture the shape of eyebrows, points #28 to #36 map the bridge and nostrils, points #37 to #48 include the contours of eyes, and points #49 to #68 outline the lips and inner mouth structure.

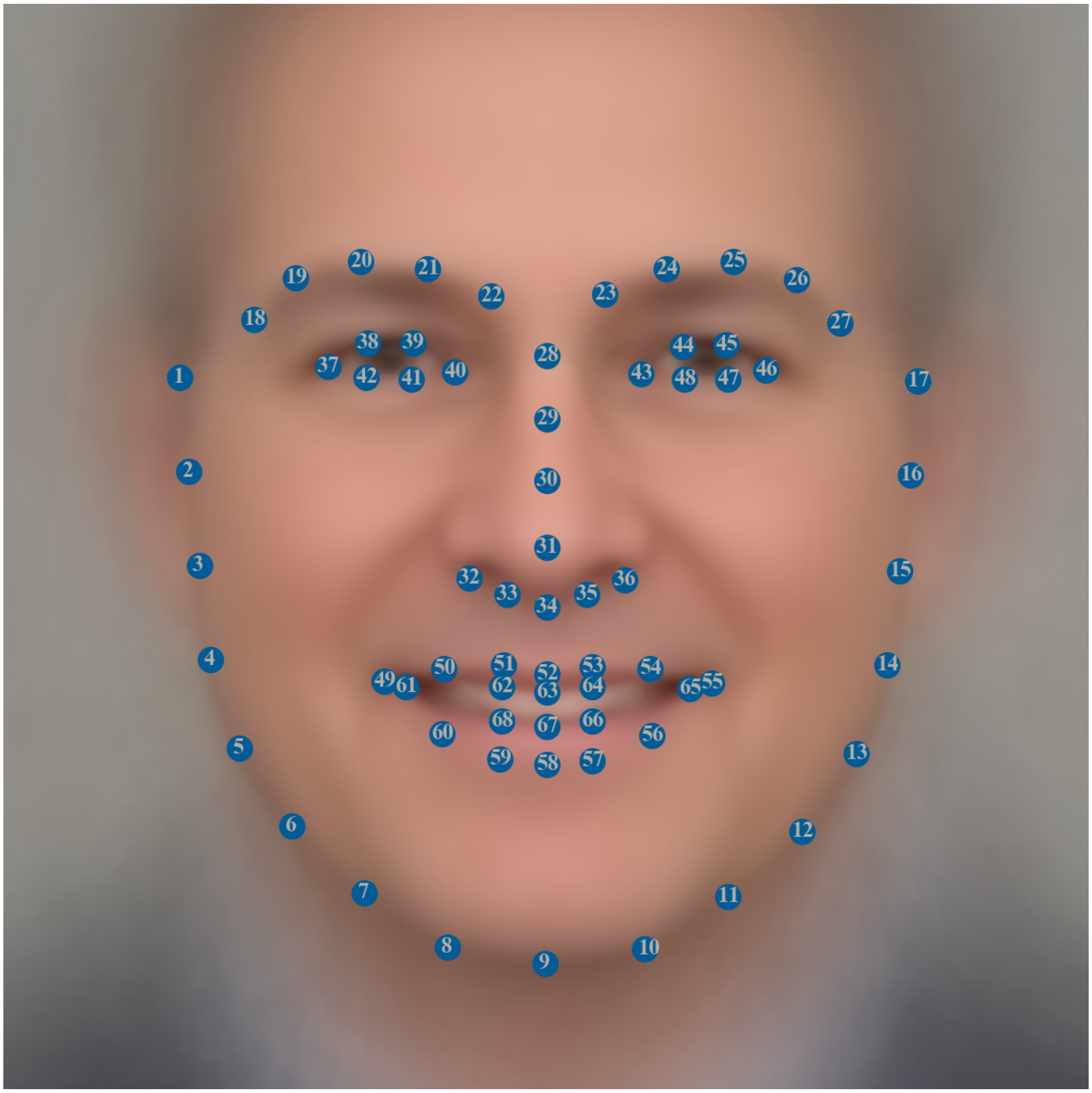

Table OA1. List of 65 Facial Attributes and Calculation Descriptions

This table illustrates the 65 facial attributes and how they are calculated from the 68 fiducial landmarks. This table is adapted from Peng et al. (2022) to align more closely with the framework of Vernon et al. (2014).

No.	Attributes	Calculation Description
01.	Head area	Area enclosed by points 1:27
02.	Head height	Vertical distance between centroid of 8:10 and centroid of 20:25
03.	Head width	Horizontal distance between centroid of 1:2 and centroid of 16:17
04.	Head orientation 1	Absolute x-axis coordinate of middle of nose (centroid of 28:36)
05.	Head orientation 2	Absolute y-axis coordinate of middle of nose (centroid of 28:36)
06.	Head tilt	Return 0 as images are standardized profile photos
07.	Eyebrow area	Area enclosed by points 18:22, 23:27
08.	Eyebrow height	Vertical distance between centroid of 18, 22, 23, 27 and centroid of 19:21, 24:26
09.	Eyebrow width	Horizontal distance between points 18, 22 and 23,27
10.	Eyebrow gradient	Absolute gradient of linear polynomial fitted through points 20:22
11.	Eye area	Average of areas enclosed by points 37:42 and 43:48
12.	Iris area	Average of areas enclosed by points 38, 39, 41, 42 and 44, 45, 47, 48
13.	Eye height	Vertical distance between centroid of 41,42,47,48 and centroid of 38,39,44,45
14.	Eye width	Horizontal distance between points 40,46 and 37,43
15.	% Iris	$(1/\pi r^2)$ × Iris area, where r is 1/2 of eye height
16.	Nose area	Average of area enclosed by points 31:36, 28, 31, 32, and 28, 31, 36
17.	Nose height	Vertical distance between points 34 and 28
18.	Nose width	Horizontal distance between points 36 and 32
19.	Nose curve	Coefficient of x^2 from quadratic polynomial fitted through points 32:36
20.	Nose flare	Vertical distance between centroid of 35,33 and centroid of 32,36
21.	Jaw height	Vertical distance between centroid of 8,10 and centroid of 3,15
22.	Jaw gradient	Absolute gradient of linear polynomial fitted through points 7:9
23.	Jaw deviation	SD of distances between all points on jaw (3:15) and point at the top of the jaw (x = average of 3:15; y = average of 3,15)
24.	Chin curve	Coefficient of x^2 from quadratic polynomial fitted through points 7:11
25.	Mouth area	Area enclosed by points 49:60
26.	Mouth height	Vertical distance between centroid of 49:55 and centroid of 56:60, 49, 55
27.	Top lip height	Vertical distance between centroid of 49:55 and centroid of 61:65, 49, 55
28.	Bottom lip height	Vertical distance between centroid of 66:68, 49, 55 and centroid of 56:60, 49, 55
29.	Mouth width	Horizontal distance between points 55 and 49
30.	Mouth gap	Vertical distance between centroid of 66:68, 49, 55 and centroid of 61:65, 49, 55
31.	Top lip curve	Coefficient of x^2 from quadratic polynomial fitted through points 61:65, 49, 55
32.	Bottom lip curve	Coefficient of x^2 from quadratic polynomial fitted through points 66:68, 49, 55

33.	Nose line separation	Horizontal distance between centroid of 33,51 and centroid of 35,53
34.	Cheekbone position	Vertical distance between points 8,10 and points 3,4,32,49
35.	Cheek gradient	Absolute gradient of linear polynomial fitted through centroid of 3,4 and centroid of 32,49
36.	Eye line gradient	Absolute gradient of linear polynomial fitted through 28 and centroid of 4 and 29
37.	Eyes position	(1/head height) × (vertical distance between centroid of 8:10 and centroid of 37:48)
38.	Eyebrow position	(1/head height) × (vertical distance between centroid of 8:10 and centroid of 18:27)
39.	Mouth position	(1/head height) × (vertical distance between centroid of 8:10 and centroid of 49:60)
40.	Nose position	(1/head height) × (vertical distance between centroid of 8:10 and centroid of 28:36)
41.	Eye separation	Horizontal distance between centroid of 38:42 and centroid of 44:48
42.	Eyes-to-mouth distance	Vertical distance between centroid of 40,43 and centroid of 51,53
43.	Eyes-to-eyebrows distance	Vertical distance between centroid of 18,22,23,27 and centroid of 38,39,44,45
44.	Left head to left eye	Horizontal distance between centroid of 1:3 and 37
45	Right head to right eye	Horizontal distance between centroid of 15:17 and 46
46.	Mouth-to-chin distance	Vertical distance between centroid of 57,59 and centroid of 8,10
47.	Mouth-to-nose distance	Vertical distance between centroid of 33:35 and centroid of 51:53
48.	Skin hue	Color information (HSV format) for area enclosed by points 1:17, 18:27
49.	Skin saturation	
50.	Skin value	
51.	Eyebrow hue	Color information (HSV format) for area enclosed by points 18:22,23:27
52.	Eyebrow saturation	
53.	Eyebrow value	
54.	Lip hue	Color information (HSV format) for area enclosed by points 49:60
55.	Lip saturation	
56.	Lip value	
57.	Iris hue	Color information (HSV format) for area enclosed by points 38,39,41,42 and 44,45,47,48
58.	Iris saturation	
59.	Iris value	
60.	Hue entropy	These attributes are based on Python module "scipy.stats.entropy," used on the hue, saturation, and value channels of the face.
61.	Saturation entropy	
62.	Value entropy	
63.	Glasses	Signifies whether the person has glasses (1) or not (0)
64.	Facial hair	Signifies whether the person has facial hair (beard, mustache) (1) or not (0)
65.	Stubble	Signifies whether the person has stubble (1) or not (0)

Table OA2. Sample Comparison

This table shows the sample comparisons. Columns (1)-(3) tabulate the mean values of key variables for (1) the sample with LinkedIn profile photos, (2) the sample with LinkedIn profiles but no profile photo, and (3) the entire Compustat/ExecuComp sample, respectively. Columns (4) and (5) compare the differences across samples. These variables are defined in the Appendix of the main text. The sample period is from 1992 to 2022. The *t*-statistics are clustered at the industry level (three-digit SIC) to account for broader dependence in the error terms within each industry. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

	LinkedIn		**ExecuComp**	**Diff.**	
	(1) Photo	**(2) No Photo**	**(3)**	**(4) (1) – (2)**	**(5) (1) – (3)**
Variables					
PATENTS	0.975	1.100	1.014	-0.125	-0.038
SIZE	7.662	7.670	7.638	-0.009	0.023
RD	0.031	0.031	0.029	0.000	0.002
FIRM AGE	2.939	3.008	2.945	-0.069	-0.006
ROA	0.121	0.117	0.122	0.004	-0.001
PPE	0.254	0.268	0.269	-0.014	-0.015
LEVERAGE	0.247	0.243	0.242	0.004	0.005
CAPEX	0.045	0.048	0.049	-0.003	-0.004
TOBIN Q	2.753	2.559	2.576	0.194	0.177
KZ INDEX	-9.433	-9.649	-10.116	0.210	0.679
HHI	0.258	0.276	0.256	-0.018	0.002
HHI SQUARED	0.107	0.125	0.109	-0.018	-0.002
INSTITUTION	0.662	0.646	0.608	0.016	0.054***
ILLIQUIDITY	0.024	0.036	0.033	-0.012*	-0.009**
FEMALE	0.050	0.034	0.032	0.015*	0.018***
AGE	55.279	56.601	56.096	-1.321***	-0.817**
TENURE	7.831	8.508	8.223	-0.676**	-0.393*
SALARY	0.758	0.735	0.735	0.023	0.023
BONUS	1.126	1.103	1.072	0.022	0.053
EQUITY HOLDINGS	53.392	66.264	59.251	-12.869	-5.871
NEW OPTION PPS	0.022	0.023	0.025	-0.001	-0.002
NEW STOCK PPS	0.009	0.008	0.008	0.001**	0.001**
DELTA	0.561	0.662	0.618	-0.102	-0.058
VEGA	0.101	0.104	0.104	-0.003	-0.003
Number of Firms	1,163	1,562	3,648		
N	10,554	8,754	47,246		

Table OA3. Full Table of CEO Perceived Trustworthiness and Employees' Trust

This table reports the impact of CEO perceived trustworthiness on employees' trust. In Panel A, the key independent variable, *CEO TRUST*, is the trustworthiness score of the CEO. Panel B repeats the regressions in Panel A by replacing *CEO TRUST* with *CEO TRUST*$_{RESIDUAL}$, which is the residual of *CEO TRUST* after partialing out all CEO related control variables. In columns (1)-(3), the dependent variables are the employees' ratings for the firm, senior leadership, and business outlook, obtained from Glassdoor. In column (4), the dependent variable is an indicator variable equal to one if a firm is listed on *Fortune* magazine's "100 Best Companies to Work For", and zero otherwise. The set of control variables is defined in Appendix 1. In columns (1)-(3), regressions include year fixed effects and firm fixed effects, and the *t*-statistics (presented in parentheses) are clustered at the firm level. The regression in column (4) includes year fixed effects, and the *t*-statistics (presented in parentheses) are calculated based on robust standard errors. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Panel A. Using *CEO TRUST*

	(1) *OVERALL RATING*	(2) *SENIOR LEADERSHIP*	(3) *BUSINESS OUTLOOK*	(4) *BEST COMPANY*
CEO TRUST	0.133**	0.126*	0.111**	0.007**
	(2.03)	(1.68)	(2.52)	(2.11)
SIZE	-0.134***	-0.151***	-0.066**	0.028***
	(-2.66)	(-2.94)	(-2.13)	(19.36)
RD	-0.514	-0.924	-0.778	0.286***
	(-0.55)	(-0.98)	(-1.49)	(9.32)
FIRM AGE	-0.054	-0.122	-0.066	-0.007***
	(-0.48)	(-1.03)	(-1.03)	(-3.21)
ROA	-0.100	-0.188	0.619***	0.107***
	(-0.33)	(-0.61)	(3.35)	(6.15)
PPE	-0.582**	-0.756***	-0.416**	0.007
	(-2.14)	(-2.60)	(-2.27)	(0.73)
LEVERAGE	-0.020	-0.048	-0.007	-0.030***
	(-0.15)	(-0.33)	(-0.08)	(-3.63)
CAPEX	1.330**	1.112	1.139**	0.111**
	(1.98)	(1.59)	(2.56)	(2.26)
TOBIN Q	0.030***	0.036***	0.021***	0.005***
	(4.16)	(4.97)	(4.65)	(7.87)
KZ INDEX	-0.001	-0.000	-0.001	-0.000
	(-0.69)	(-0.29)	(-1.33)	(-0.82)
HHI	0.315	0.964	0.548	0.096***
	(0.42)	(1.17)	(1.25)	(4.15)
HHI SQUARED	0.042	-0.846	-0.050	-0.065**
	(0.06)	(-1.05)	(-0.12)	(-2.45)
INSTITUTION	0.012	0.002	0.025	0.006
	(0.26)	(0.05)	(0.70)	(1.14)
ILLIQUIDITY	0.057	0.146**	0.033	0.030***
	(0.80)	(2.04)	(0.75)	(3.57)
FEMALE	-0.017	0.054	0.045	-0.016**
	(-0.27)	(0.80)	(1.06)	(-2.43)
AGE	0.001	0.002	-0.001	-0.001***
	(0.38)	(0.55)	(-0.43)	(-3.46)
TENURE	0.000	0.000	0.001	0.001**
	(0.06)	(0.01)	(0.52)	(2.31)
EDU	-0.106**	-0.109**	-0.040	-0.004**
	(-2.49)	(-2.18)	(-1.38)	(-2.54)
SALARY	-0.023	-0.004	-0.017	-0.047***
	(-0.40)	(-0.05)	(-0.45)	(-6.90)

BONUS	0.007	0.010	0.024***	-0.003**
	(0.70)	(0.93)	(3.68)	(-2.24)
EQUITY HOLDINGS	0.000	-0.000	-0.000	0.000***
	(0.35)	(-0.24)	(-0.75)	(4.22)
NEW OPTION PPS	-0.147	-0.220	0.027	0.140***
	(-0.60)	(-0.87)	(0.16)	(4.16)
NEW STOCK PPS	-1.306***	-0.953*	-0.316	-0.443***
	(-2.74)	(-1.89)	(-0.86)	(-5.67)
DELTA	0.011	0.021	0.022**	-0.002
	(0.62)	(1.28)	(2.44)	(-1.36)
VEGA	0.055	0.056	-0.010	0.023**
	(0.63)	(0.63)	(-0.18)	(2.42)
Firm FE and Year FE	YES	YES	YES	Year FE
Adjusted R^2	0.548	0.514	0.458	0.092
N	2,751	2,751	2,751	9,974

Panel B. Using the Residual of *CEO TRUST*

	(1) ***OVERALL RATING***	(2) ***SENIOR LEADERSHIP***	(3) ***BUSINESS OUTLOOK***	(4) ***BEST COMPANY***
CEO TRUST$_{RESIDUAL}$	0.136**	0.132*	0.109**	0.006**
	(2.01)	(1.72)	(2.40)	(2.00)
SIZE	-0.134***	-0.151***	-0.067**	0.028***
	(-2.66)	(-2.94)	(-2.13)	(19.39)
RD	-0.513	-0.923	-0.776	0.286***
	(-0.55)	(-0.98)	(-1.49)	(9.32)
FIRM AGE	-0.053	-0.122	-0.065	-0.007***
	(-0.48)	(-1.03)	(-1.02)	(-3.22)
ROA	-0.101	-0.189	0.617***	0.107***
	(-0.34)	(-0.61)	(3.34)	(6.16)
PPE	-0.584**	-0.757***	-0.418**	0.007
	(-2.15)	(-2.60)	(-2.28)	(0.74)
LEVERAGE	-0.018	-0.047	-0.006	-0.030***
	(-0.14)	(-0.32)	(-0.07)	(-3.63)
CAPEX	1.328**	1.111	1.137**	0.110**
	(1.98)	(1.59)	(2.55)	(2.25)
TOBIN Q	0.031***	0.036***	0.021***	0.005***
	(4.17)	(4.98)	(4.66)	(7.87)
KZ INDEX	-0.001	-0.000	-0.001	-0.000
	(-0.68)	(-0.29)	(-1.33)	(-0.83)
HHI	0.312	0.962	0.545	0.096***
	(0.42)	(1.17)	(1.24)	(4.15)
HHI SQUARED	0.044	-0.844	-0.048	-0.065**
	(0.06)	(-1.05)	(-0.11)	(-2.45)
INSTITUTION	0.012	0.002	0.025	0.006
	(0.26)	(0.04)	(0.71)	(1.14)
ILLIQUIDITY	0.059	0.149**	0.034	0.030***
	(0.84)	(2.11)	(0.77)	(3.57)
FEMALE	0.001	0.071	0.059	-0.015**
	(0.01)	(1.05)	(1.37)	(-2.28)
AGE	0.001	0.002	-0.001	-0.001***
	(0.29)	(0.47)	(-0.55)	(-3.51)
TENURE	0.000	0.000	0.001	0.001**
	(0.13)	(0.07)	(0.60)	(2.35)
EDU	-0.104**	-0.107**	-0.038	-0.004**
	(-2.45)	(-2.15)	(-1.31)	(-2.48)

SALARY	-0.017	0.002	-0.012	-0.047***
	(-0.30)	(0.03)	(-0.32)	(-6.86)
BONUS	0.007	0.010	0.024***	-0.003**
	(0.74)	(0.97)	(3.71)	(-2.23)
EQUITY HOLDINGS	0.000	-0.000	-0.000	0.000***
	(0.36)	(-0.23)	(-0.73)	(4.22)
NEW OPTION PPS	-0.160	-0.233	0.016	0.140***
	(-0.66)	(-0.92)	(0.09)	(4.15)
NEW STOCK PPS	-1.291***	-0.938*	-0.304	-0.443***
	(-2.71)	(-1.86)	(-0.83)	(-5.67)
DELTA	0.009	0.019	0.021**	-0.002
	(0.55)	(1.21)	(2.33)	(-1.40)
VEGA	0.079	0.079	0.009	0.024**
	(0.88)	(0.86)	(0.17)	(2.55)
Firm FE and Year FE	YES	YES	YES	Year FE
Adjusted R^2	0.548	0.514	0.458	0.092
N	2,751	2,751	2,751	9,974

Table OA4. Full Table of CEO Perceived Trustworthiness and Shareholders' Trust

This table reports the impact of CEO perceived trustworthiness on shareholders' trust. In Panel A, the key independent variable, *CEO TRUST*, is the trustworthiness score of the CEO. Panel B repeats the regressions in Panel A by replacing *CEO TRUST* with $CEO\ TRUST_{RESIDUAL}$, which is the residual of *CEO TRUST* after partialing out all CEO related control variables. In columns (1) and (2), the dependent variables are the average percentage of for and against votes over management-proposed agendas at annual shareholders' meetings, respectively. The percentage of "for" ("against") votes is calculated as the number of "for" ("against") votes divided by the total number of "for", "abstain", and "against" votes. The key independent variable, *CEO TRUST*, is the trustworthiness score of the CEO. In columns (3) and (4), the dependent variables are the cash flow of financing activities and the debt issuance. For columns (1)-(4), the key independent variable, *CEO TRUST*, is the trustworthiness score of the CEO. Columns (5) and (6) report the subsample analysis based on whether a firm's CEO has high perceived trustworthiness. The dependent variable is an indicator variable equal to one if a firm's CEO is terminated in the following year, and zero otherwise. The key independent variable is an indicator equal to one if the firm has low ROA. A firm is defined to have low (high) CEO perceived trustworthiness or ROA if their measures are in (above) the bottom quintile compared with contemporaneous two-digit SIC peers. All regressions include year fixed effects and firm fixed effects. The set of control variables is defined in Appendix 1. Reflecting the signed nature of the prediction, the test for the difference in coefficients is one-sided. The sample period is from 2003 to 2022 for columns (1) and (2), and from 1992 to 2022 for columns (3) and (6). The *t*-statistics (presented in parentheses) are clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Panel A. Using *CEO TRUST*

	(1) ***FOR VOTES***	(2) ***AGAINST VOTES***	(3) ***FINANCING CASH FLOW***	(4) ***DEBT ISSUANCE***	(5) ***CEO TERMINATION***	(6) ***CEO TERMINATION***
Subsample =					***Low CEO TRUST***	***High CEO TRUST***
CEO TRUST	0.016***	-0.017***	0.149**	0.170***		
	(3.82)	(-3.94)	(2.28)	(3.08)		
LOW ROA					0.025**	0.002
					(2.02)	(0.27)
SIZE	-0.001	0.001	0.198***	0.188***	-0.012	0.007
	(-0.67)	(0.54)	(7.08)	(7.44)	(-1.00)	(1.00)
RD	-0.092	0.084	0.446	0.201	0.389**	-0.140
	(-1.64)	(1.50)	(0.93)	(0.65)	(2.56)	(-1.47)
FIRM AGE	-0.014***	0.014***	-0.213***	-0.142***	0.047**	0.021*
	(-3.25)	(3.09)	(-4.50)	(-3.49)	(2.27)	(1.93)
ROA	0.037***	-0.035***	-0.508***	-0.323***	0.125**	-0.116***
	(3.01)	(-2.82)	(-3.42)	(-2.66)	(2.08)	(-3.23)
PPE	-0.022*	0.020	-0.908***	-0.652***	-0.135**	-0.037
	(-1.74)	(1.53)	(-5.76)	(-4.53)	(-2.12)	(-0.94)
LEVERAGE	-0.003	0.002	0.644***	0.620***	0.079*	0.026
	(-0.46)	(0.28)	(6.05)	(6.09)	(1.76)	(1.14)
CAPEX	0.108***	-0.107***	0.721**	1.014***	0.224**	0.078
	(3.42)	(-3.17)	(2.08)	(3.76)	(2.23)	(0.98)

TOBIN Q	0.000	-0.000	0.023***	0.014**	-0.004*	0.001
	(0.63)	(-0.99)	(3.14)	(2.01)	(-1.88)	(1.01)
KZ INDEX	-0.000**	0.000**	-0.001	-0.003***	-0.000	-0.000
	(-1.99)	(2.19)	(-1.22)	(-3.60)	(-0.52)	(-0.43)
HHI	0.007	-0.007	-0.630*	-0.587**	-0.083	-0.036
	(0.24)	(-0.24)	(-1.93)	(-2.00)	(-0.54)	(-0.35)
HHI SQUARED	-0.013	0.010	0.455	0.463	0.162	0.071
	(-0.37)	(0.27)	(1.35)	(1.60)	(0.94)	(0.53)
INSTITUTION	0.001	-0.001	0.034	0.007	0.012	0.005
	(0.29)	(-0.32)	(0.62)	(0.13)	(0.83)	(0.46)
ILLIQUIDITY	-0.010	0.010	0.029	0.052	-0.011	0.021
	(-0.92)	(0.96)	(0.36)	(0.68)	(-0.62)	(1.33)
FEMALE	0.008**	-0.008**	0.030	0.003	0.027	-0.005
	(2.21)	(-2.18)	(0.47)	(0.06)	(0.51)	(-0.21)
AGE	0.000	-0.000	-0.002	-0.002	0.002*	0.001*
	(0.17)	(-0.10)	(-0.93)	(-0.99)	(1.72)	(1.93)
TENURE	-0.000	-0.000	0.003	0.003	-0.002*	-0.001
	(-0.07)	(-0.33)	(1.30)	(1.50)	(-1.72)	(-1.54)
EDU	-0.001	0.002	-0.133***	-0.112**	-0.011	-0.012
	(-0.43)	(0.68)	(-2.61)	(-2.47)	(-0.46)	(-0.74)
SALARY	-0.005	0.006	-0.275***	-0.208***	-0.135***	-0.107***
	(-1.15)	(1.31)	(-5.00)	(-3.97)	(-2.98)	(-4.34)
BONUS	-0.001	0.001	-0.007	-0.011	-0.003	-0.003
	(-1.30)	(0.92)	(-0.68)	(-1.21)	(-0.66)	(-1.48)
EQUITY HOLDINGS	0.000	0.000	-0.000**	-0.000	-0.000	-0.000**
	(0.31)	(0.43)	(-2.20)	(-1.62)	(-1.14)	(-2.01)
NEW OPTION PPS	-0.011	0.020	0.448***	0.435**	-0.074	0.050
	(-0.52)	(0.80)	(2.67)	(2.39)	(-1.02)	(1.30)
NEW STOCK PPS	0.038	-0.031	-0.161	0.301	0.155	0.153
	(1.25)	(-0.91)	(-0.33)	(0.66)	(0.66)	(1.00)
DELTA	-0.000	0.000	0.011	0.006	0.004**	0.001
	(-0.38)	(0.44)	(1.61)	(0.78)	(2.13)	(0.69)
VEGA	-0.002	0.002	-0.014	-0.014	-0.038	-0.032***
	(-0.46)	(0.41)	(-0.25)	(-0.21)	(-1.26)	(-3.03)
Equal *LOW ROA? (F*-stat*)*					2.83** (p=0.05)	
Firm FE and Year FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.322	0.321	0.163	0.144	0.091	0.035
N	8,681	8,681	10,554	10,554	2,779	7,775

Panel B. Using the Residual of *CEO TRUST*

	(1) *FOR VOTES*	(2) *AGAINST VOTES*	(3) *FINANCING CASH FLOW*	(4) *DEBT ISSUANCE*	(5) *CEO TERMINATION*	(6) *CEO TERMINATION*
Subsample =					***Low CEO $TRUST_{RESIDUAL}$***	***High CEO $TRUST_{RESIDUAL}$***
CEO TRUST	0.017***	-0.018***	0.137**	0.164***		
	(3.88)	(-3.99)	(2.05)	(2.91)		
LOW ROA					0.024*	0.000
					(1.89)	(0.00)
SIZE	-0.001	0.001	0.197***	0.187***	-0.012	0.008
	(-0.68)	(0.55)	(7.06)	(7.41)	(-1.00)	(1.20)
RD	-0.092	0.083	0.453	0.207	-0.002	-0.053
	(-1.63)	(1.50)	(0.94)	(0.68)	(-0.01)	(-0.77)
FIRM AGE	-0.014***	0.014***	-0.212***	-0.141***	0.040*	0.021*
	(-3.26)	(3.09)	(-4.48)	(-3.47)	(1.93)	(1.96)
ROA	0.038***	-0.035***	-0.509***	-0.323***	0.096	-0.114***
	(3.02)	(-2.83)	(-3.42)	(-2.66)	(1.43)	(-3.17)
PPE	-0.022*	0.021	-0.908***	-0.652***	-0.077	-0.037
	(-1.77)	(1.56)	(-5.76)	(-4.53)	(-1.22)	(-0.92)
LEVERAGE	-0.003	0.002	0.644***	0.620***	0.080	0.028
	(-0.44)	(0.27)	(6.04)	(6.09)	(1.61)	(1.25)
CAPEX	0.109***	-0.107***	0.723**	1.017***	0.200*	0.076
	(3.43)	(-3.19)	(2.08)	(3.77)	(1.83)	(0.96)
TOBIN Q	0.000	-0.000	0.023***	0.014**	-0.005**	0.001
	(0.63)	(-0.99)	(3.13)	(2.01)	(-2.09)	(1.11)
KZ INDEX	-0.000**	0.000**	-0.001	-0.003***	-0.000	-0.000
	(-1.99)	(2.19)	(-1.21)	(-3.59)	(-0.56)	(-0.41)
HHI	0.007	-0.007	-0.629*	-0.588**	-0.054	-0.056
	(0.23)	(-0.24)	(-1.93)	(-2.01)	(-0.35)	(-0.55)
HHI SQUARED	-0.014	0.010	0.452	0.461	0.118	0.095
	(-0.37)	(0.28)	(1.35)	(1.59)	(0.69)	(0.71)
INSTITUTION	0.001	-0.001	0.034	0.007	0.011	0.006
	(0.28)	(-0.31)	(0.62)	(0.12)	(0.63)	(0.58)
ILLIQUIDITY	-0.010	0.010	0.030	0.053	-0.002	0.019
	(-0.92)	(0.95)	(0.37)	(0.69)	(-0.12)	(1.07)
FEMALE	0.011***	-0.011***	0.048	0.026	0.035	-0.010
	(2.76)	(-2.75)	(0.74)	(0.43)	(0.65)	(-0.44)
AGE	-0.000	0.000	-0.002	-0.002	0.003**	0.001

	(-0.03)	(0.11)	(-1.07)	(-1.17)	(2.29)	(1.44)
TENURE	0.000	-0.000	0.003	0.003	-0.002*	-0.001
	(0.05)	(-0.45)	(1.38)	(1.60)	(-1.65)	(-1.09)
EDU	-0.001	0.001	-0.129**	-0.108**	-0.013	-0.013
	(-0.32)	(0.57)	(-2.55)	(-2.39)	(-0.54)	(-0.81)
SALARY	-0.005	0.005	-0.269***	-0.200***	-0.179***	-0.100***
	(-0.97)	(1.13)	(-4.84)	(-3.80)	(-3.98)	(-4.14)
BONUS	-0.001	0.001	-0.007	-0.011	-0.006*	-0.003
	(-1.23)	(0.85)	(-0.65)	(-1.17)	(-1.77)	(-1.24)
EQUITY HOLDINGS	0.000	0.000	-0.000**	-0.000	-0.000	-0.000*
	(0.35)	(0.41)	(-2.17)	(-1.59)	(-1.35)	(-1.95)
NEW OPTION PPS	-0.013	0.022	0.434***	0.418**	-0.026	0.049
	(-0.61)	(0.88)	(2.59)	(2.30)	(-0.39)	(1.25)
NEW STOCK PPS	0.040	-0.033	-0.147	0.317	0.152	0.165
	(1.32)	(-0.97)	(-0.30)	(0.70)	(0.66)	(1.12)
DELTA	-0.000	0.000	0.010	0.005	0.005**	0.001
	(-0.55)	(0.61)	(1.45)	(0.61)	(2.33)	(0.62)
VEGA	0.001	-0.001	0.010	0.015	-0.061**	-0.032***
	(0.15)	(-0.14)	(0.18)	(0.23)	(-2.11)	(-2.80)
Equal *LOW ROA? (F*-stat*)*					2.89** (p=0.04)	
Firm FE and Year FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.322	0.322	0.163	0.144	0.097	0.031
N	8681	8681	10,554	10,554	2,737	7,721

Table OA5. Full Table of CEO Perceived Trustworthiness and Stock Analysts' Trust

This table reports the impact of CEO perceived trustworthiness on stock analysts' trust. In column (1), the key independent variable, *CEO TRUST*, is the trustworthiness score of the CEO. Column (2) repeats the regressions in Panel A by replacing *CEO TRUST* with *CEO TRUST$_{RESIDUAL}$*, which is the residual of *CEO TRUST* after partialing out all CEO related control variables. The dependent variable *FORECAST SPEED* is calculated as the inverse of the median number of days for stock analysts to revise their earnings forecasts after earnings conference calls. All regressions include year fixed effects and firm fixed effects. The set of control variables is defined in Appendix 1. The sample period is from 2001 to 2020. The *t*-statistics (presented in parentheses) are clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1) ***FORECAST SPEED***	(2) ***FORECAST SPEED***
CEO TRUST	0.059**	
	(2.14)	
CEO TRUST$_{RESIDUAL}$		0.061**
		(2.15)
SIZE	0.027**	0.027**
	(2.24)	(2.23)
RD	0.032	0.033
	(0.20)	(0.21)
FIRM AGE	0.028	0.028
	(1.41)	(1.41)
ROA	0.141***	0.142***
	(2.88)	(2.90)
PPE	-0.059	-0.059
	(-0.98)	(-0.98)
LEVERAGE	-0.104***	-0.104***
	(-3.25)	(-3.23)
CAPEX	0.232**	0.233**
	(1.99)	(2.01)
TOBIN Q	0.000	0.000
	(0.18)	(0.18)
KZ INDEX	0.000	0.000
	(1.57)	(1.58)
HHI	-0.208	-0.208
	(-1.25)	(-1.25)
HHI SQUARED	0.233	0.233
	(1.38)	(1.38)
INSTITUTION	-0.025	-0.025
	(-1.32)	(-1.32)
ILLIQUIDITY	-0.102	-0.102
	(-1.60)	(-1.60)
FEMALE	0.022	0.030
	(1.03)	(1.36)
AGE	-0.000	-0.000
	(-0.22)	(-0.36)
TENURE	-0.000	-0.000
	(-0.26)	(-0.20)
EDU	-0.029*	-0.027*
	(-1.84)	(-1.82)

SALARY	-0.006	-0.003
	(-0.29)	(-0.15)
BONUS	0.007**	0.007**
	(2.08)	(2.13)
EQUITY HOLDINGS	0.000	0.000
	(1.14)	(1.17)
NEW OPTION PPS	0.141*	0.135
	(1.70)	(1.63)
NEW STOCK PPS	-0.099	-0.094
	(-0.74)	(-0.70)
DELTA	0.000	-0.000
	(0.09)	(-0.04)
VEGA	-0.029	-0.019
	(-1.11)	(-0.68)
Firm FE and Year FE	YES	YES
Adjusted R^2	0.425	0.425
N	4,698	4,698

Table OA6. Full Table of Main Results Using *CEO TRUST*$_{RESIDUAL}$

This table reports the full table of main results using *CEO TRUST*$_{RESIDUAL}$ (Table 5 Panel C in the main text). In column (1), the dependent variable *Ln(PATENTS)* is the natural logarithm of one plus the number of patents a firm filed in year $t + 1$. In column (2), the dependent variable *Ln(FORWARD CITATIONS)* is the natural logarithm of one plus the number of forward citations received by a firm's patents in year $t + 1$. In column (3), the dependent variable *Ln(CITATIONS PER PATENT)* is the natural logarithm of one plus the average number of citations received by a firm's filed patents in year $t + 1$. In column (4), the dependent variable *Ln($VALUER)* is the natural logarithm of one plus the average real dollar value of a firm's filed patents in year $t + 1$. In column (5), the dependent variable *Ln($VALUEN)* is the natural logarithm of one plus the average nominal dollar value of a firm's filed patents in year $t + 1$. In column (6), the dependent variable *Ln(NOVELTY)* is the natural logarithm of one plus the average patent novelty of a firm's filed patents in year $t + 1$. In column (7), the dependent variable *Ln(SCOPE)* is the natural logarithm of one plus the average patent scope of a firm's filed patents in year $t + 1$. In column (8), the dependent variable *Ln(ORIGINALITY)* is the natural logarithm of one plus the average patent originality of a firm's filed patents in year $t + 1$. The patent citations and dollar values are retrieved from the Kogan et al. (2017) database. The novelty, scope, and originality of each patent are computed following past studies on innovation (Trajtenberg et al. 1997; Seru 2014; Dong et al. 2021; Tian et al. 2025). The key independent variable is *CEO TRUST*$_{RESIDUAL}$, defined as the residual from regressing *CEO TRUST* on all CEO-level control variables. The control variables are defined in detail in Appendix 1. All regressions include year fixed effects and firm fixed effects. The sample period is from 1992 to 2022. The *t*-statistics (presented in parentheses) are clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ln(PATENTS)	***Ln(FORWARD CITATIONS)***	***Ln(CITATIONS PER PATENT)***	***Ln($VALUER)***	***Ln($VALUEN)***	***Ln(NOVELTY)***	***Ln(SCOPE)***	***Ln(ORIGINALITY)***
CEO TRUST$_{RESIDUAL}$	0.255***	0.573***	0.265***	0.832**	0.859**	0.078***	0.021**	0.037***
	(3.51)	(3.73)	(3.13)	(2.01)	(1.97)	(3.03)	(2.28)	(2.91)
SIZE	0.190***	0.157**	0.020	0.892***	0.946***	0.012	0.007*	0.020***
	(4.73)	(2.24)	(0.50)	(4.48)	(4.52)	(1.11)	(1.88)	(3.67)
RD	1.245***	1.739*	0.482	5.805**	6.102**	-0.087	0.105*	0.183**
	(2.63)	(1.93)	(0.97)	(2.23)	(2.21)	(-0.56)	(1.66)	(2.34)
FIRM AGE	-0.006	-0.055	-0.086	-0.491	-0.527	-0.010	0.004	0.002
	(-0.09)	(-0.43)	(-1.22)	(-1.41)	(-1.44)	(-0.59)	(0.47)	(0.18)
ROA	-0.024	-0.343	-0.144	0.631	0.690	0.014	-0.040**	-0.007
	(-0.16)	(-1.14)	(-0.82)	(0.75)	(0.78)	(0.27)	(-2.18)	(-0.25)
PPE	0.524***	1.001***	0.403*	1.640	1.717	0.041	0.065***	0.057**
	(2.97)	(2.93)	(1.91)	(1.61)	(1.60)	(0.76)	(2.90)	(2.02)
LEVERAGE	-0.103	-0.298	-0.131	-0.155	-0.148	-0.017	-0.006	-0.020
	(-1.17)	(-1.56)	(-1.14)	(-0.29)	(-0.26)	(-0.55)	(-0.56)	(-1.30)
CAPEX	0.112	-0.407	-0.194	0.588	0.690	0.052	-0.019	-0.092*
	(0.41)	(-0.73)	(-0.50)	(0.25)	(0.28)	(0.41)	(-0.44)	(-1.72)
TOBIN Q	0.012*	0.020	0.016**	0.118***	0.123***	0.005**	0.002**	0.000
	(1.80)	(1.58)	(2.11)	(3.25)	(3.20)	(2.34)	(2.44)	(0.42)
KZ INDEX	-0.000	0.001	0.001	0.002	0.001	0.000	0.000	0.000
	(-0.09)	(0.86)	(1.42)	(0.34)	(0.30)	(0.23)	(1.15)	(0.50)
HHI	0.689	1.365	0.603	0.112	0.038	0.147	0.043	-0.026
	(1.11)	(1.25)	(1.01)	(0.05)	(0.02)	(1.09)	(0.72)	(-0.36)
HHI SQUARED	-0.676	-1.538	-0.720	0.257	0.357	-0.154	-0.065	0.011

	(-0.94)	(-1.21)	(-1.18)	(0.12)	(0.15)	(-1.24)	(-0.98)	(0.14)
INSTITUTION	-0.052	0.125	0.099*	-0.031	-0.046	-0.003	0.006	0.004
	(-0.82)	(1.15)	(1.67)	(-0.09)	(-0.13)	(-0.21)	(1.01)	(0.50)
ILLIQUIDITY	-0.006	-0.060	-0.048	-0.195	-0.213	-0.021	-0.004	-0.026*
	(-0.15)	(-0.65)	(-0.93)	(-0.81)	(-0.83)	(-1.35)	(-0.67)	(-1.86)
FEMALE	0.086	0.175	0.101	0.574	0.601	0.031	0.005	0.016
	(1.25)	(1.39)	(1.54)	(1.24)	(1.23)	(1.58)	(0.59)	(1.28)
AGE	-0.000	0.002	0.002	-0.009	-0.010	0.001	-0.000	0.000
	(-0.20)	(0.44)	(0.79)	(-0.49)	(-0.52)	(0.93)	(-0.05)	(0.47)
TENURE	0.002	-0.001	-0.002	0.008	0.009	-0.001	-0.000	-0.000
	(0.57)	(-0.13)	(-0.70)	(0.42)	(0.45)	(-0.77)	(-0.56)	(-0.38)
EDU	-0.029	-0.063	-0.019	-0.113	-0.121	-0.010	-0.005	-0.008
	(-0.55)	(-0.69)	(-0.46)	(-0.48)	(-0.49)	(-0.96)	(-1.18)	(-1.14)
SALARY	-0.043	-0.027	0.031	0.034	0.028	0.005	0.003	-0.005
	(-0.57)	(-0.19)	(0.45)	(0.07)	(0.05)	(0.24)	(0.42)	(-0.45)
BONUS	0.006	0.004	0.007	0.126*	0.133*	0.006	0.002*	0.002
	(0.58)	(0.18)	(0.59)	(1.90)	(1.91)	(1.51)	(1.88)	(1.29)
EQUITY HOLDINGS	0.000	-0.000	-0.000	0.001	0.001	0.000	-0.000	0.000
	(0.38)	(-0.37)	(-0.91)	(0.81)	(0.83)	(0.23)	(-0.85)	(1.21)
NEW OPTION PPS	0.363	0.701	0.289	-0.796	-0.915	0.010	0.020	0.041
	(1.54)	(1.25)	(0.82)	(-0.50)	(-0.55)	(0.10)	(0.63)	(1.18)
NEW STOCK PPS	2.402**	2.667	0.583	8.542***	8.990***	0.249	0.052	0.088
	(2.41)	(1.57)	(0.91)	(2.79)	(2.80)	(1.62)	(0.72)	(0.84)
DELTA	-0.009	-0.006	0.002	-0.066	-0.070	-0.003	0.000	-0.002
	(-0.84)	(-0.24)	(0.19)	(-1.48)	(-1.48)	(-0.82)	(0.37)	(-1.19)
VEGA	0.084	0.008	-0.054	0.534	0.594	0.032	-0.006	0.013
	(0.87)	(0.04)	(-0.55)	(0.93)	(0.99)	(1.03)	(-0.63)	(0.80)
Year FE and Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.864	0.790	0.657	0.703	0.703	0.607	0.550	0.620
N	10554	10554	10,554	10,554	10,554	10,554	10,554	10,554

Table OA7. Full Table of Innovation Riskiness and Efficiency

This table reports the full table of regression results on mechanisms of innovation riskiness and efficiency (Table 7 in the main text). In columns (1)-(3), the dependent variable *Ln(SD FORWARD CITATIONS)* is the natural logarithm of one plus the standard deviation of the number of five-year forward citations received by patents filed by a firm in year $t + 1$. In columns (4)-(6), the dependent variable *Ln(PATENTS to RD)* is the natural logarithm of one plus the number of patents filed by a firm in year $t + 1$ divided by the firm's five-year rolling R&D intensity (i.e., $[RD_t + 0.8 \times RD_{t-1} + 0.6 \times RD_{t-2} + 0.4 \times RD_{t-3} + 0.2 \times RD_{t-4}]/5$). Columns (1)-(2) and (4)-(5) show the specifications with (i) *CEO TRUST* only, and (ii) *CEO TRUST*, firm fundamental variables, and CEO characteristics, respectively. Columns (3) and (6) replace *CEO TRUST* with *CEO TRUST_{RESIDUAL}*, defined as the residual from regressing *CEO TRUST* on all CEO-level control variables. The control variables are defined in detail in Appendix 1. All regressions include year fixed effects and firm fixed effects. The sample period is from 1992 to 2022. The *t*-statistics (presented in parentheses) are clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

	(1) *Ln(SD FORWARD CITATIONS)*	(2) *Ln(SD FORWARD CITATIONS)*	(3) *Ln(SD FORWARD CITATIONS)*	(4) *Ln(PATENTS to RD)*	(5) *Ln(PATENTS to RD)*	(6) *Ln(PATENTS to RD)*
CEO TRUST	0.324***	0.325***		0.427**	0.499***	
	(3.01)	(2.69)		(2.36)	(2.92)	
CEO TRUST$_{RESIDUAL}$			0.330***			0.529***
			(2.60)			(3.05)
SIZE		0.076*	0.075*		0.616***	0.615***
		(1.94)	(1.91)		(5.98)	(5.97)
RD		-0.614	-0.602		-0.356	-0.347
		(-1.43)	(-1.40)		(-0.44)	(-0.43)
FIRM AGE		-0.060	-0.059		0.331	0.333
		(-0.68)	(-0.67)		(1.19)	(1.20)
ROA		0.180	0.180		-0.012	-0.009
		(0.72)	(0.72)		(-0.04)	(-0.03)
PPE		0.445	0.447		1.029	1.024
		(1.41)	(1.41)		(1.34)	(1.34)
LEVERAGE		-0.164	-0.161		-0.334	-0.329
		(-1.37)	(-1.35)		(-1.42)	(-1.40)
CAPEX		-0.584	-0.578		1.085	1.104
		(-0.86)	(-0.85)		(0.78)	(0.79)
TOBIN Q		0.011	0.011		0.009	0.009
		(1.39)	(1.39)		(0.78)	(0.78)
KZ INDEX		-0.002**	-0.002**		0.000	0.000
		(-1.97)	(-1.98)		(0.14)	(0.14)
HHI		-0.101	-0.076		1.435	1.437
		(-0.20)	(-0.15)		(0.87)	(0.88)
HHI SQUARED		-0.552	-0.581		-1.973	-1.975
		(-1.13)	(-1.20)		(-0.99)	(-1.00)

INSTITUTION		-0.026	-0.027		-0.165	-0.167
		(-0.32)	(-0.34)		(-0.64)	(-0.65)
ILLIQUIDITY		-0.107	-0.107		-0.136	-0.137
		(-1.06)	(-1.05)		(-1.25)	(-1.27)
FEMALE		0.090	0.133		-0.028	0.044
		(0.75)	(1.10)		(-0.12)	(0.19)
AGE		0.001	0.000		0.008	0.007
		(0.24)	(0.10)		(0.93)	(0.80)
TENURE		-0.000	-0.000		-0.008	-0.007
		(-0.11)	(-0.04)		(-0.98)	(-0.91)
EDU		-0.058	-0.051		-0.199	-0.189
		(-1.23)	(-1.09)		(-1.14)	(-1.09)
SALARY		0.177**	0.193**		-0.167	-0.137
		(2.16)	(2.36)		(-0.85)	(-0.69)
BONUS		0.002	0.003		0.019	0.020
		(0.16)	(0.23)		(0.49)	(0.52)
EQUITY HOLDINGS		-0.000	-0.000		-0.000	-0.000
		(-0.70)	(-0.67)		(-0.21)	(-0.18)
NEW OPTION PPS		-0.323	-0.352*		0.127	0.074
		(-1.65)	(-1.78)		(0.28)	(0.17)
NEW STOCK PPS		1.250**	1.290**		3.812**	3.851**
		(2.22)	(2.30)		(2.42)	(2.46)
DELTA		0.006	0.003		0.014	0.010
		(0.69)	(0.39)		(0.62)	(0.43)
VEGA		0.014	0.071		-0.093	-0.001
		(0.19)	(0.92)		(-0.51)	(-0.00)
Year FE and Firm FE	YES	YES	YES	YES	YES	YES
Adjusted R^2	0.598	0.605	0.605	0.801	0.813	0.813
N	3,114	3,114	3,114	4,647	4,647	4,647