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CEO Linguistic Signals and Rank-and-File Stock Option Grants

: A Python-Based Textual Analysis of Earnings Conference Calls

CEO의 언어적 신호와 일반 직원 스톡옵션 부여

: 실적발표 컨퍼런스콜의 파이썬 기반 텍스트 분석

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<Abstract>

This study examines how CEO narcissism affects rank-and-file stock option grants. Using 4,444 U.S. firm-year observations drawn from S&P Capital IQ earnings call transcripts, ExecuComp, and Compustat, we find that the level of CEO narcissism-measured as the ratio of first-person singular pronouns to total first-person pronouns spoken by the CEO during the question-and-answer portion of earnings conference calls-is positively and significantly associated with the magnitude of stock options granted to non-executive employees. This effect is more pronounced in firms with larger employee bases and in firms exhibiting income-increasing discretionary accruals, consistent with the notion that narcissistic CEOs deploy rank-and-file options as a low-cost, high-visibility instrument that simultaneously cultivates admiration from a broad internal audience and expands the discretionary fair-value estimation latitude embedded in stock-based compensation. Overall, our findings highlight the previously underexamined role of CEO personal characteristics as an upstream

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determinant of rank-and-file equity compensation and broaden the upper-echelons perspective into a new compensation domain.

<Key words> CEO Narcissism, Rank-and-File Stock Options, Linguistic Analysis, Earnings Conference Calls, Upper Echelons
<JEL Classification> G34 ; J33 ; M12 ; M41

<요 약>

본 연구는 CEO의 나르시시즘이 일반 직원(rank-and-file) 스톡옵션 부여에 미치는 영향을 분석한다. S&P Capital IQ 실적발표 컨퍼런스콜 녹취록, ExecuComp, Compustat에서 추출한 4,444개의 미국 기업-연도 관측치를 이용하여 분석한 결과, 실적발표 컨퍼런스콜의 질의응답(Q&A) 과정에서 CEO가 사용한 1인칭 단수 대명사가 전체 1인칭 대명사에서 차지하는 비율로 측정한 CEO 나르시시즘 수준은 비임원 직원에게 부여된 스톡옵션 규모와 유의한 양(+)의 관계를 보였다. 이러한 효과는 직원 수가 많은 기업과 이익 증가형 재량적 발생액을 보고하는 기업에서 더욱 뚜렷하게 나타났으며, 이는 나르시시즘 성향의 CEO가 일반 직원 스톡옵션을 저비용·고가시성 수단으로 활용하여 폭넓은 내부 구성원으로부터 찬사를 얻는 동시에 주식기준보상에 내재된 공정가치 추정의 재량 여지를 확대한다는 견해와 일치한다. 전반적으로 본 연구의 결과는 일반 직원 지분보상의 상위 결정요인으로서 지금까지 충분히 검토되지 않았던 CEO 개인 특성의 역할을 조명하고, 최고경영진 이론(upper echelons)의 관점을 새로운 보상 영역으로 확장한다.

<주제어> CEO 나르시시즘, 일반 직원 스톡옵션, 언어 분석, 실적발표 컨퍼런스콜, 최고경영진 이론

Ⅰ. Introduction

Employee stock options are a common feature of modern corporate compensation. Firms use them to align employee incentives with shareholder interests, attract and retain talent, and conserve cash when facing financial constraints (Core and Guay, 2001 ; Oyer and Schaefer, 2005). Although prior research has examined the determinants of executive stock option grants in detail, much less is known about what shapes stock option grants to rank-and-file employees—an area in which CEOs typically exercise substantial discretion. Executive pay is closely monitored by compensation committees and subject to strict disclosure rules, but rank-and-file option grants face weaker oversight. Compensation committees rarely review the size or distribution of these awards at the same level of detail as executive packages, and disclosures about them are typically aggregated rather than itemized. This leaves room for CEO-specific characteristics to influence how these awards are designed and sized.

In this study, we examine whether linguistic signals in CEO communication during earnings

call question-and-answer (Q&A) sessions predict the size of rank-and-file stock option grants. Specifically, we focus on the ratio of first-person singular pronouns (e.g., "I", "me", "my") to total first-person pronouns (singular plus plural) used by the CEO in unscripted Q&A exchanges. Prior work has validated this measure as a behavioral marker of CEO self-orientation (Raskin and Shaw, 1988 ; Aktas et al., 2016 ; Capalbo et al., 2018). It also offers an unobtrusive, archival measure that does not rely on survey responses or post-hoc psychometric assessments. Q&A sessions are particularly well suited to this purpose because, unlike the prepared remarks portion of an earnings call, they require CEOs to respond in real time to analyst questions. This setting reduces the influence of scripted language and investor relations staff, leaving the CEO's own speech patterns more clearly visible.

Theoretically, it is not clear ex ante how CEO linguistic signals should relate to rank-and-file option grants. Under an efficient contracting view, option grants are shaped by firm-level economic conditions—financing constraints, labor market pressures, and accounting environments—and should therefore be largely unrelated to CEO personal characteristics (Core and Guay, 2001 ; Oyer and Schaefer, 2005 ; Ittner et al., 2003). Under a managerial opportunism view, however, the discretion that CEOs hold over rank-and-file compensation creates room for self-serving behavior. We argue that CEOs with stronger self-referential linguistic signals are especially likely to use this discretion, for two related reasons. First, narcissistic CEOs are drawn to visible, employee-friendly actions that attract external admiration. Prior research has documented this tendency in R&D investment (Kashmiri et al., 2017), corporate social responsibility (Petrenko et al., 2016 ; Chen et al., 2021), and mergers and acquisitions (Aktas et al., 2016). We propose that rank-and-file option grants are another such tool, made particularly attractive by the absence of immediate cash outflows and by their favorable accounting treatment. Broad-based option programs are also frequently highlighted in press releases, recruiting materials, and media coverage, which amplifies the reputational benefits a self-oriented CEO can derive from them. Second, narcissistic CEOs are more likely to engage in earnings management and aggressive financial reporting (Olsen and Stekelberg, 2016 ; Capalbo et al., 2018), and rank-and-file option grants—with their discretionary fair-value estimates and short-term price-supportive effects—offer a useful instrument for these purposes. The combination of reputational and reporting incentives makes broad-based option grants a uniquely attractive lever for CEOs who already display self-oriented tendencies in their public communication.

Using a sample of U.S. firm-year observations drawn from S&P Capital IQ earnings call transcripts, ExecuComp, and Compustat, we construct a CEO-year linguistic signal measure (*Nar_CEO*) and regress rank-and-file stock option grants on *Nar_CEO*, controlling for firm

characteristics and industry and year fixed effects. The control set includes firm size, leverage, liquidity constraints, operating losses, growth opportunities, profitability, operating cash flow, sales, R&D intensity, and cash holdings ; in robustness tests, we further control for CEO age, tenure, gender, and overconfidence. This design helps ensure that *Nar_CEO* captures variation in CEO self-orientation rather than observable economic or career-stage differences. We find a positive and statistically significant association between *Nar_CEO* and rank-and-file stock option grants. The effect is also economically meaningful : a one-standard-deviation increase in *Nar_CEO* is associated with an approximately 0.024-percentage-point increase in options granted to non-executive employees as a fraction of shares outstanding, roughly 6.7% of the sample mean.

To shed light on the underlying channels, we conduct three cross-sectional tests. First, the positive association is stronger in firms with larger employee bases, where CEOs have a wider audience over which to use compensation as a tool of recognition and influence. This pattern is consistent with the view that broad-based option grants serve, in part, as a vehicle for CEO visibility and self-presentation rather than purely as a retention device. Second, the association is stronger in firms with higher levels of earnings management, consistent with rank-and-file options serving as part of a broader self-serving financial reporting strategy. Third, the association is stronger among firms with high analyst coverage, where the external visibility of broad-based grants—and hence the reputational payoff to conspicuous generosity—is greatest. Together, these cross-sectional results suggest that the relation between *Nar_CEO* and option grants is not driven by a single mechanism but reflects both reputational and reporting motives. Our findings are robust to entropy balancing, which addresses observable selection between firms with high- and low-narcissism CEOs, and to a battery of additional control variables, including alternative proxies for governance quality and CEO power, as well as to firm fixed effects, additional CEO characteristics (age, tenure, gender, and overconfidence), and a CEO turnover analysis that exploits within-firm changes in CEO narcissism.

Our paper makes three contributions. First, we extend the literature on rank-and-file stock options by repositioning these grants from an independent variable—as treated in studies of their consequences for whistleblowing, real earnings management, and audit risk (Call et al., 2016 ; Holderness et al., 2019 ; Abdulsalam, 2025)—to a dependent variable shaped by CEO characteristics. In doing so, we also broaden the determinants literature, which has traditionally focused on firm-level explanations such as financing constraints and retention motives (Core and Guay, 2001 ; Oyer and Schaefer, 2005 ; Ittner et al., 2003), by introducing CEO personal characteristics as a previously unexamined antecedent. Second, we contribute to the upper-

echelons literature by identifying a new domain—rank-and-file employee compensation—through which CEO linguistic signals are reflected in observable corporate decisions, complementing prior evidence on R&D, M&A, CSR, and earnings management. Third, we contribute to the textual analysis literature in accounting and finance by providing a parsimonious, theory-grounded application of CEO language to a new compensation setting. Our findings have practical implications for boards, compensation committees, and auditors monitoring CEO discretion in employee compensation design, and they suggest that routinely available earnings call transcripts can serve as a low-cost diagnostic tool for governance monitoring.

The remainder of this paper is organized as follows. Section Ⅱ reviews prior literature and develops the empirical hypotheses. Section Ⅲ describes the research design, including data, variable measurements, and the empirical model. Section Ⅳ presents the main empirical results and robustness tests. Finally, Section Ⅴ summarizes the findings and provides conclusions and implications.

Ⅱ. Literature Review and Hypothesis Development

1. Rank-and-File Employee Stock Options

Prior research on rank-and-file (RF) stock options has developed along two relatively independent streams. The first stream examines the determinants of these grants at the firm level, while the second stream examines their consequences for firm outcomes. We review each stream in turn and identify a gap that motivates our study.

A first stream of literature investigates the firm-level determinants of rank-and-file stock option grants. Three theoretical perspectives have been advanced. First, under the financing constraints view, firms grant options to lower-level employees as a substitute for cash compensation when facing capital requirements and financial constraints. Core and Guay (2001), examining 756 U.S. firms during 1994—1997, document that firms use greater stock option compensation when facing capital requirements and financing constraints, consistent with cash-constrained firms substituting options for cash pay. Second, under the sorting and retention view, firms use broad-based option grants to attract optimistic and productive employees, satisfy participation constraints when reservation wages comove with the market, and retain key personnel. Oyer (2004) argues that broad-based options help satisfy participation constraints when employees' outside options are correlated with the firm's stock price. Oyer and Schaefer (2005),

examining stock-option grants to middle managers across alternative theoretical justifications, conclude that observed grant patterns are most consistent with sorting and retention motives rather than incentive provision or cash conservation. Ittner, Lambert, and Larcker (2003) further document, using survey evidence from new economy firms, that employee retention is the most-cited objective of stock option plans, followed by performance milestones and the attraction of new employees. Third, under the accounting and tax view, firms grant options to capitalize on the favorable accounting treatment of option-based compensation. Hall and Murphy (2003) argue that the proliferation of option-based pay arises in significant part from accounting rules that historically allowed firms substantial latitude in how option-related compensation expense was reported. Aboody and Kasznik (2008) document the role of tax incentives in shaping option grant decisions. Despite the diversity of these perspectives, all three share a common analytical focus : they explain rank-and-file stock option grants as a function of firm-level characteristics—cash flow position, labor market conditions, R&D intensity, industry classification, and accounting environment. Notably absent from this literature is any sustained examination of the role of CEO personal characteristics in shaping these grants. This omission is striking because rank-and-file option grants represent a domain in which CEOs exercise substantial discretion, free from the direct oversight that governs executive compensation decisions.

A second stream of literature examines the consequences of rank-and-file stock options for firm outcomes, presenting two contrasting views. The negative view, rooted in behavioral risk theory (Yandrick, 1996), argues that RF options can induce information distortion and concealment. Call et al. (2016) show that granting more stock options to RF employees significantly reduces whistleblowing : because option value is directly tied to the stock price and employees cannot dispose of options during the vesting period, RF employees fear losses from stock-price declines if negative information becomes public, and therefore tend to remain silent about bad news. Holderness et al. (2019) document that RF options tie employee compensation directly to performance, increasing performance pressure and giving employees stronger incentives to engage in real earnings management—particularly because RF employees exert more influence over operational decisions than over accounting estimates. Most recently, Abdulsalam (2025) provides evidence that RF options intensify performance manipulation and information asymmetry, leading to higher audit risk and audit fees. The positive view, rooted in agency theory and incentive alignment, argues that RF options enhance long-term value creation and information quality. Hochberg and Lindsey (2010) document a positive causal link between RF options and operating performance. Bova et al. (2015) find that RF options are negatively associated with firm risk, particularly when executives face stronger incentives to take risk. Armstrong et al. (2010)

emphasize that RF options can strengthen internal monitoring by middle management, weakening managerial incentives for bad-news hoarding. Sloan (2016) emphasizes that the fundamental role of stock options is long-term alignment, fostering organizational stability, internal cooperation, and monitoring. Most recently, Chen et al. (2025) document that RF options promote peer monitoring and information sharing, reducing workplace safety incidents.

Across these contrasting views, however, the literature shares a common analytical structure : rank-and-file options are treated as an exogenous input whose downstream effects on firm outcomes are of central interest. The question of *why* and *by whom* such grants are issued in the first place—particularly at the level of the individual CEO who exercises discretion over these decisions—remains largely outside the scope of this stream.

Taken together, the two streams reveal a notable gap. The determinants stream explains RF option grants through firm-level economic conditions but does not systematically incorporate CEO personal characteristics. If CEO personal characteristics meaningfully influence these decisions, they constitute an important and previously underexamined determinant—and may also offer an upstream explanation for the adverse downstream effects documented in the consequences literature. Our study addresses this gap by introducing CEO-level linguistic signals as a determinant of rank-and-file stock option grants, thereby bridging the determinants and consequences streams while extending the upper-echelons literature into a previously unexplored compensation domain.

2. Hypothesis Development

We argue that CEOs who use more self-focused language—an indicator of narcissistic tendencies—are more likely to grant larger stock options to rank-and-file employees. We develop this argument based on two related reasons rooted in how narcissistic CEOs make decisions. The clinical and organizational literatures characterize narcissism by grandiosity, attention-seeking, an unrealistically inflated self-view, and a profound dependence on external admiration to sustain that self-view (American Psychiatric Association ; Wallace and Baumeister, 2002 ; Chatterjee and Hambrick, 2007 ; Judge et al., 2006). Because narcissists' self-concept is fundamentally reliant upon admiration and recognition from external constituencies, narcissistic CEOs systematically gravitate toward visible, observable corporate actions that generate validation from external audiences.

Prior research consistently documents this pattern across multiple decision domains. Narcissistic CEOs invest disproportionately in research and development and pursue high-profile mergers and acquisitions (Chatterjee and Hambrick, 2007 ; Kashmiri et al., 2017 ; Aktas et al., 2016), engage

actively in peripheral corporate social responsibility activities even when these are tangential to core operations (Petrenko et al., 2016 ; Chen et al., 2021), and exhibit pronounced volatility in firm performance as a result of these high-visibility decisions (Chatterjee and Hambrick, 2011). Across these domains, the common thread is that narcissistic CEOs prefer corporate actions that are observable, attention-generating, and conducive to image cultivation.

We argue that rank-and-file stock option grants represent another instance of such visible, employee-friendly actions, and one that is particularly attractive to narcissistic CEOs. Three features make these grants an unusually efficient instrument for image cultivation. First, the grants generate immediate and salient signals of generosity to a broad internal audience—the firm's employees—whose admiration directly satisfies the narcissist's need for validation. Second, unlike cash bonuses or salary increases, option grants do not entail an immediate cash outflow, allowing the CEO to project generosity without depleting firm resources that the CEO may prefer to retain for other discretionary uses. Third, the accounting treatment of stock-based compensation is favorable : while GAAP earnings reflect option-related expenses, market-watched non-GAAP measures (e.g., adjusted EPS, pro forma earnings) typically exclude them, and fair-value estimation involves substantial managerial discretion. Together, these features render rank-and-file options a uniquely "low-cost, high-visibility" instrument through which narcissistic CEOs can cultivate admiration and loyalty.

A second, complementary reason arises from the documented tendency of narcissistic CEOs to make decisions oriented toward their personal gains rather than firm-level needs. Through the lens of perceptual filtering (England, 1967 ; Weick, 1979), narcissistic CEOs selectively acquire and interpret information in service of their own goals. Prior literature documents that this disposition manifests in distortive financial reporting : greater engagement in tax sheltering (Olsen and Stekelberg, 2016), more aggressive earnings management (Capalbo et al., 2018), weaker internal controls (Salehi et al., 2021), and—in extreme cases—fraud (Rijsenbilt and Commandeur, 2013 ; Donelson et al., 2017). Narcissistic CEOs are also overly optimistic about future outcomes and tend to underestimate associated risks (O'Reilly et al., 2018), reinforcing their willingness to deploy aggressive financial reporting strategies. Consistent with this self-serving orientation, prior studies further document that narcissistic CEOs extract pay-performance premia—earning higher compensation relative to performance than their non-narcissistic counterparts (Ham et al., 2018 ; O'Reilly et al., 2014).

We argue that rank-and-file stock option grants serve as an instrument through which narcissistic CEOs operationalize this self-serving orientation. Stock-based compensation is laden with reporting discretion : fair-value estimation requires assumptions about expected volatility,

expected term, and forfeiture rates—each providing a lever through which managers can shape reported expenses (Aboody et al., 2006 ; Bartov and Mohanram, 2004). Larger option grants expand the absolute magnitude of these discretionary estimates, thereby enlarging the CEO's reporting latitude. Beyond reporting effects, broad-based option grants can serve as positive market signals that elevate short-term stock prices (Core and Guay, 2001), and the share repurchases conducted to offset dilution from option exercises further inflate earnings per share (Bens et al., 2003 ; Kahle, 2002). Each of these channels directly increases the value of the CEO's own equity holdings, providing a direct personal payoff to grant decisions that are nominally directed at rank-and-file employees.

However, CEO narcissism could also lead to the opposite prediction. Narcissists are frequently characterized as self-centered, low in empathy, and inattentive to subordinate welfare (Judge et al., 2006)—traits that may weaken their willingness to share the firm's economic upside with non-executive employees. Under this alternative view, narcissistic CEOs would prefer to concentrate compensation and incentives at the executive level, where the rewards go to themselves, rather than distribute equity claims broadly across the workforce. In our view, however, rank-and-file option grants differ from genuine welfare-sharing in that they allow the CEO to appear generous at little personal cost : such grants entail no immediate cash outflow, are excluded from market-watched non-GAAP performance measures, expand the CEO's reporting discretion, and can support short-term stock prices from which the CEO's personal equity holdings benefit directly. To a narcissistic CEO, broad-based grants thus represent self-interested generosity rather than altruistic redistribution. Accordingly, we expect the reputational and reporting motives to outweigh the compensation-hoarding motive on net, leading to our hypothesis :

[Hypothesis] CEO narcissism is positively associated with rank-and-file stock option grants.

Ⅲ. Research Design

1. Data and Sample

To measure CEO narcissism, we obtain earnings conference call transcripts from S&P Capital IQ, focusing on the question-and-answer (Q&A) portion of each call to capture relatively spontaneous and unscripted CEO speech. To construct proxies for rank-and-file stock option grants as well as executive compensation and related variables, we draw on data from

ExecuComp. Control variables are obtained from Compustat by merging the two databases at the firm-year level.

The sample period spans fiscal years 2009 through 2018[1]. Table 1 summarizes our sample selection process. We begin with 21,137 firm-year observations in ExecuComp over this period. We first exclude 5,412 observations from firms operating in the financial and utility industries, as these sectors are subject to distinct regulatory environments and reporting requirements that may render their compensation structures incomparable to those of other industries. We then require the availability of CEO-level textual data : because our transcript collection and CEO speaker-identification procedures are based on S&P 500 constituents, 10,297 observations without matched Q&A-level textual data are eliminated. Finally, we remove 984 observations with missing values for any variable required in the construction of our key measures or control variables, to ensure consistency across all regression specifications. After applying these sample selection criteria, our final sample consists of 4,444 firm-year observations.

〈Table 1〉 Sample Selection

Sample selection procedure	Firm-year observations
Total firm-year observations from ExecuComp (2009-2018)	21,137
Less : financial and utility industries	(5,412)
Less : missing textual (narcissism) data	(10,297)
Less : missing financial data	(984)
Final sample	4,444

Note : This table reports our sample selection process.

2. Definition of Variables

(1) CEO Narcissism

Following the methodology established in prior research (Raskin and Shaw 1988 ; Aktas et al. 2016 ; Capalbo et al. 2018), we proxy CEO narcissism using earnings conference call transcripts

1) Our sample period begins in 2009 for two reasons. First, the coverage of conference call transcripts in S&P Capital IQ-the source of our CEO narcissism measure-becomes substantially more comprehensive and stable from 2009 onward, ensuring consistent measurement across firms. Second, starting in 2009 excludes the 2007-2008 financial crisis, during which both compensation practices and CEO communication behavior were subject to unusual distortions.

obtained from S&P Capital IQ. Our measurement approach focuses exclusively on the question-and-answer (Q&A) portion of each call, which captures relatively spontaneous and unscripted CEO speech. Within this Q&A segment, we count the frequency with which the CEO uses first-person singular pronouns ("I", "me", "my", "mine", "myself") and divide this count by the total number of first-person pronouns spoken by the CEO—that is, first-person singular pronouns combined with first-person plural pronouns ("we", "us", "our", "ours", "ourselves"). The resulting ratio is expressed as follows :

(I, me, my, mine, myself)/(I, me, my, mine, myself, we, us, our, ours, ourselves) (1)

By construction, the score increases as the CEO's verbal style shifts from collective ("we"-centered) toward individualistic ("I"-centered) self-reference, with higher values reflecting stronger narcissistic tendencies. We compute this ratio at the CEO-year level using the raw transcript data, and label the resulting variable *Nar_CEO,* which serves as our primary empirical proxy for CEO narcissism throughout the analyses.

(2) Rank-and-file Employee Stock Option

Our primary independent variable captures stock option grants allocated to rank-and-file employees. To construct this measure, we follow the approach of Call et al. (2016) and estimate rank-and-file option grants by subtracting option awards to top executives and non-executive managers from the firm's total option grants. Since neither Compustat nor ExecuComp directly discloses option grant data for rank-and-file employees, we infer this figure indirectly. Specifically, total option grants are sourced from Compustat, while executive grants are drawn from ExecuComp. For non-executive manager grants, we adopt the convention established by Oyer and Schaefer (2005) and Hochberg and Lindsey (2010), approximating them as one-tenth of the combined option grants received by the second through fifth highest-compensated executives. The resulting estimate of R&F option grants is then normalized by the number of common shares outstanding. We then multiply this scaled value by 1,000 to ease interpretation, yielding our key variable of interest, *RF_Option*. Accordingly, a value of 3.553—the sample mean reported in Table 2—indicates that options granted to rank-and-file employees represent approximately 0.36% of shares outstanding. We note that grant-date fair values of options awarded to non-executive employees are not separately disclosed in Compustat or ExecuComp ; our measure is therefore based on the number of options granted rather than their fair value, a data limitation we acknowledge in Section 5.

3. Empirical Model

To examine the relation between CEO narcissism and stock option grants to rank-and-file employees, we estimate the following regression model :

$$RF_Option_{i,t} = \beta_0 + \beta_1 Nar_CEO_{i,t} + \Sigma \beta_k Controls_{i,t} + \text{Industry FE} + \text{Year FE} + \varepsilon_{i,t} \quad (2)$$

The dependent variable, R&F Option, measures the level of stock option grants awarded to rank-and-file employees, as previously defined in Section Ⅲ.2.(2). *Nar_CEO* denotes CEO narcissism, as defined in Section Ⅲ.2.(1). We also include a set of control variables associated with both R&F Option and CEO Narcissism. Size is measured as the natural logarithm of total assets. Leverage is defined as total debt divided by total assets. Liquidity Constraint is an indicator variable that equals one if operating cash flow is negative, and zero otherwise. MTB represents the ratio of market value to book value. ROA is calculated as operating income divided by total assets at the beginning of the fiscal year. CFO denotes operating cash flow, measured as cash flow from operations divided by total assets. We also control for Sales, defined as the natural logarithm of total revenues. R&D Expense is research and development expenditure scaled by total assets. Additionally, we control for Cash Holding, defined as cash and cash equivalents divided by total assets. All regressions include industry fixed effects based on two-digit SIC codes and year fixed effects. Standard errors are clustered at the firm level. Detailed definitions of all control variables are provided in Appendix A.

Ⅳ. Main Results

1. Descriptive statistics

Table 2 presents the descriptive statistics for the primary variables used in our empirical analysis, based on a total of 4,444 firm-year observations. The table summarizes the observation count (N), mean, minimum, 10th percentile (p10), 25th percentile (p25), median (p50), 75th percentile (p75), 90th percentile (p90), maximum, and standard deviation (SD) for each variable. Regarding our primary dependent variable representing rank-and-file stock option grants, we find that the mean (median) of *RF_Option*—the number of stock options granted to rank-and-file employees scaled by shares outstanding and multiplied by 1,000—is 3.553 (0.875), with a

standard deviation of 6.165, indicating that rank-and-file grants represent on average approximately 0.36% of shares outstanding. Notably, both the 10th and 25th percentiles are 0.000, indicating that a non-trivial fraction of firms in our sample do not grant rank-and-file options in a given year, while the 90th percentile reaches 10.038, confirming the substantial right-skewness of broad-based equity grants across firms. These distributional characteristics are qualitatively consistent with the descriptive statistics reported in seminal studies on rank-and-file equity compensation (Core and Guay, 2001 ; Oyer and Schaefer, 2005 ; Hochberg and Lindsey, 2010), confirming that meaningful heterogeneity in option granting decisions is embedded within our sample. Our key independent variable, *Nar_CEO*, which measures CEO narcissism via the ratio of first-person singular pronouns to total first-person pronouns in the Q&A portion of earnings call transcripts, shows a mean of 0.289 and a standard deviation of 0.136. The variable spans its full theoretical support, ranging from 0.000 to 1.000. These figures indicate that linguistic variation in CEO self-reference patterns persists consistently within the focal firms, providing sufficient cross-sectional dispersion to empirically test how such narcissistic dispositions translate into rank-and-file compensation decisions and the firm's broader information environment. The descriptive statistics for the control variables align with the typical characteristics of U.S. listed firms found in finance and accounting literature. The average firm size (*Size*) is 8.073, and the average leverage (*Lev*) is 0.284, indicating that debt accounts for approximately 28.4% of total assets. Firms reporting a net loss (*Loss*) make up only 5.8% of the sample, while firms experiencing liquidity constraints (*Liq_Const*) account for 3.5%. We observe mean values of 3.529 for the market-to-book ratio (*MTB*) and 0.065 for return on assets (*ROA*), reflecting the firms' market valuation and operating profitability. Additionally, the mean cash flow from operations (*CFO*), included to control for internal financing capacity, is 0.110, while sales (*Sale*) averages 7.861. The mean R&D intensity (*R&D*) and cash holdings ratio (*Cash*), included to control for innovation environment and financial slack, are 0.032 and 0.166, respectively. In summary, the principal financial characteristics of our sample exhibit stable distributions, and the expanded distributional statistics allow readers to assess skewness and the presence of extreme values directly, establishing a suitable data structure for the subsequent multivariate regression analysis.

〈Table 2〉 Descriptive Statistics

Variable	N	Mean	Min	p10	p25	p50	p75	p90	Max	SD
RF_Option	4,444	3.553	0.000	0.000	0.000	0.875	4.607	10.038	16.256	6.165
Nar_CEO	4,444	0.289	0.000	0.141	0.195	0.268	0.361	0.483	1.000	0.136
Size	4,444	8.073	4.924	6.127	6.932	7.901	9.147	10.328	11.940	1.561
Lev	4,444	0.284	0.000	0.000	0.110	0.256	0.400	0.574	1.199	0.237
Liq_Const	4,444	0.035	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.183
Loss	4,444	0.058	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.234
MTB	4,444	3.529	0.687	1.054	1.668	2.677	4.332	7.604	11.250	6.781
ROA	4,444	0.065	−0.232	−0.007	0.028	0.060	0.101	0.158	0.325	0.079
CFO	4,444	0.110	−0.138	0.041	0.070	0.104	0.146	0.199	0.325	0.070
Sale	4,444	7.861	4.293	6.014	6.869	7.783	8.835	9.813	11.787	1.484
R&D	4,444	0.032	0.000	0.000	0.000	0.000	0.038	0.104	0.343	0.062
Cash	4,444	0.166	0.001	0.012	0.037	0.103	0.230	0.412	0.883	0.182

Note : This table presents descriptive statistics for the variables used in our main regression model. Definitions of all variables are provided in Appendix A.

Table 3 presents the Pearson correlation coefficients among the primary variables of this study. The univariate correlation coefficient between our key independent variable, CEO narcissism (*Nar_CEO*), and the rank-and-file option grant measure (*RF_Option*) is 0.052, statistically significant at the 1% level ($p = 0.001$). While this value indicates a positive direction consistent with our central hypothesis, univariate analysis does not account for various confounding factors that influence option granting decisions, such as firm size (*Size*), profitability (*ROA*), R&D intensity (*R&D*), and the existence of operating losses (*Loss*). Therefore, we must conduct a multivariate regression analysis—including all control variables—to isolate and verify the independent and net effect of CEO narcissism on rank-and-file option grants. The highest correlation between independent variables occurs between firm size (*Size*) and sales (*Sale*), with a coefficient of 0.905, reflecting the natural conceptual overlap between two firm-scale proxies that are widely used in the compensation literature as complementary controls. Although this magnitude exceeds the conventional 0.7 benchmark for multicollinearity concern, we additionally verified through variance inflation factor (VIF) diagnostics that severe multicollinearity does not undermine the empirical model. Other notable correlations—such as those between *ROA* and *Loss* (−0.496), *CFO* and *ROA* (0.654), and *R&D* and *Cash* (0.595)—remain well below the 0.7

threshold, supporting the conclusion that no severe multicollinearity issues exist within our empirical model.

〈Table 3〉 Correlation Table

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) *RF_Option*	1.000											
(2) *Nar_CEO*	0.052	1.000										
	(0.001)											
(3) *Size*	−0.145	−0.020	1.000									
	(0.000)	(0.172)										
(4) *Lev*	−0.068	−0.009	0.306	1.000								
	(0.000)	(0.570)	(0.000)									
(5) *Liq_Const*	0.144	0.035	−0.144	0.036	1.000							
	(0.000)	(0.019)	(0.000)	(0.017)								
(6) *Loss*	0.147	0.036	−0.141	−0.052	0.331	1.000						
	(0.000)	(0.017)	(0.000)	(0.000)	(0.000)							
(7) *MTB*	0.033	−0.056	−0.019	−0.076	0.021	0.015	1.000					
	(0.029)	(0.000)	(0.208)	(0.000)	(0.159)	(0.304)						
(8) *ROA*	−0.024	−0.052	−0.028	−0.113	−0.272	−0.496	0.121	1.000				
	(0.110)	(0.000)	(0.062)	(0.000)	(0.000)	(0.000)	(0.000)					
(9) *CFO*	−0.036	−0.070	−0.057	−0.177	−0.491	−0.285	0.123	0.654	1.000			
	(0.017)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)				
(10) *Sale*	−0.180	−0.047	0.905	0.206	−0.173	−0.238	−0.002	0.113	0.058	1.000		
	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.915)	(0.000)	(0.000)			
(11) *R&D*	0.313	0.012	−0.256	−0.163	0.249	0.296	0.164	−0.097	−0.057	−0.332	1.000	
	(0.000)	(0.421)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
(12) *Cash*	0.243	0.001	−0.319	−0.238	0.148	0.156	0.128	0.120	0.127	−0.364	0.595	1.000
	(0.000)	(0.934)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	

Note : This table reports correlations between variables used in main regression model. P−values are reported in parentheses, and coefficients significant at the 1% level ($p<0.01$) are shown in bold.

2. Main findings

Table 4 presents the results of the multivariate regression analysis examining how CEO narcissism (*Nar_CEO*) affects the focal firm's rank−and−file stock option grants. We use the number of stock options granted to rank−and−file employees scaled by shares outstanding and

multiplied by 1,000 (*RF_Option*) as the dependent variable. To control for unobserved industry-specific characteristics and macroeconomic shocks, the model includes both industry fixed effects and year fixed effects. We calculate t-statistics using robust standard errors clustered at the firm level to adjust for cross-sectional and time-series correlations in the error terms. The analysis reveals that the regression coefficient for our primary variable of interest, *Nar_CEO*, is 1.739 (t-value=2.695), statistically significant at the 1% level in a positive direction. The effect is also economically meaningful : a one-standard-deviation increase in *Nar_CEO* (0.136) is associated with a 0.237-unit increase in *RF_Option* (1.739×0.136), equivalent to an approximately 0.024-percentage-point increase in rank-and-file option grants relative to shares outstanding, or roughly 6.7% of the sample mean. The model achieves an adjusted R^2 of 0.172 over 4,444 firm-year observations. Notably, several control variables behave consistently with theoretical expectations : firm size (0.961, t=4.740), liquidity constraints (1.324, t=2.188), and operating losses (2.265, t=4.736) are positively associated with rank-and-file option grants, supporting the cash-substitution view of broad-based equity compensation, while sales (−1.137, t=−5.385) loads negatively. R&D intensity exhibits the largest economic effect (20.205, t=10.005), consistent with prior evidence that innovation-intensive firms rely heavily on broad-based equity compensation to attract and retain talent. These findings are consistent with our central hypothesis. Specifically, in an environment where CEOs exercise substantial discretion over rank-and-file compensation—free from the direct oversight that governs executive pay—narcissistic CEOs are associated with larger stock option grants to non-executive employees. To the extent that narcissistic CEOs seek to validate an inflated self-view, they may have incentives to project generosity through visible, low-cost equity compensation rather than disburse cash, while the discretionary fair-value estimation embedded in stock-based compensation expands their reporting latitude. We caution, however, that our evidence is associational : larger rank-and-file grants need not imply inefficient compensation design, and our results do not directly establish managerial intent. Interestingly, while prior research (Holderness et al., 2019 ; Abdulsalam, 2025) suggests that broad-based option grants amplify performance pressure on rank-and-file employees, our results indicate that the upstream determinant of these grants—the CEO's personal narcissistic disposition—has received little attention in the literature. Accordingly, the results suggest that CEO-level linguistic signals of narcissism are associated with the use of rank-and-file equity compensation, consistent with broad-based grants serving in part as an image-cultivation device.

〈Table 4〉 Main Result

	(1)
Variables	*RF_Option*
Nar_CEO	1.739***
	(2.695)
Size	0.961***
	(4.740)
Lev	−0.860**
	(−2.010)
Liq_Const	1.324**
	(2.188)
Loss	2.265***
	(4.736)
MTB	−0.018
	(−1.402)
ROA	3.603**
	(2.123)
CFO	1.956
	(0.964)
Sale	−1.137***
	(−5.385)
R&D	20.205***
	(10.005)
Cash	1.078
	(1.644)
Constant	3.083***
	(4.869)
Industry FE	yes
Year FE	yes
Observations	4,444
Adj R^2	0.172

Note : This table reports the main regression results examining the relations between CEO narcissism and rank-and-file stock option grants. t-values are reported in parentheses. Industry and year fixed effects are included. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

3. Cross-sectional test

(1) Number of Employees

The reputation-cultivation behavior of narcissistic CEOs in granting rank-and-file options to harvest admiration may vary depending on the breadth of the internal audience—specifically, the number of employees who can observe and respond to the CEO's apparent generosity. If the reputational benefit scales with audience size, narcissistic CEOs should be especially active in granting rank-and-file options when the firm has a larger employee base. Conversely, in firms with smaller workforces, the recognition channel becomes less salient, and the association between CEO narcissism and rank-and-file option grants should be attenuated. To test this mechanism, we partitioned the sample into "Emp_High" and "Emp_Low" groups based on the median value of the number of employees. According to the results in Table 5, the regression coefficient for *Nar_CEO* in the Emp_High group (Column 1) is 1.994 (t-value=2.638), statistically significant at the 1% level in a positive direction, as expected. In contrast, for the Emp_Low group (Column 2), where the audience for the CEO's symbolic generosity is limited, the coefficient is 0.998 (t-value=0.927) and loses its statistical significance entirely. A Chow test formally rejects the equality of the *Nar_CEO* coefficients across the two subsamples ($F=2.76$, $p<0.10$). These findings suggest that the positive association between CEO narcissism and rank-and-file option grants is amplified when the internal audience is sufficiently broad, a pattern consistent with the reputation-cultivation channel articulated in our hypothesis development. We acknowledge, however, that firms with larger employee bases may differ along other dimensions, and we therefore interpret this partition as a cross-sectional setting consistent with—rather than direct confirmation of—the proposed mechanism.

〈Table 5〉 Cross-Sectional Analysis : Number of Employees

Variables	*Dependent variable : RF_Option*	
	(1) Emp_High	(2) Emp_Low
Nar_CEO	1.994***	0.998
	(2.638)	(0.927)
Size	0.934***	1.338***
	(3.800)	(4.010)

〈Table 5〉 Cross-Sectional Analysis : Number of Employees (continued)

	Dependent variable : RF_Option	
	(1)	(2)
Variables	Emp_High	Emp_Low
Lev	0.516	−2.366***
	(1.033)	(−3.285)
Liq_Const	−0.642	1.143
	(−0.571)	(1.426)
Loss	2.633***	1.449**
	(3.019)	(2.277)
MTB	−0.014	−0.022
	(−1.126)	(−0.799)
ROA	4.444*	2.881
	(1.943)	(1.172)
CFO	5.330**	1.031
	(1.995)	(0.340)
Sale	−0.834***	−1.907***
	(−3.019)	(−5.333)
R&D	7.232**	22.307***
	(2.162)	(8.135)
Cash	−0.991	0.035
	(−0.980)	(0.039)
Constant	0.302	6.453***
	(0.307)	(4.985)
Industry FE	yes	yes
Year FE	yes	yes
Observations	2,231	2,210
Adj R^2	0.130	0.219

Note : This table reports the results of additional analyses examining whether the main results differ depending on the number of employees. Column (1) reports the results for the subsample of firms above the median number of employees (Emp_High), while Column (2) reports the results for the subsample of firms below the median (Emp_Low). t−values are reported in parentheses. Industry and year fixed effects are included. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. A Chow test rejects the equality of the Nar_CEO coefficients across the two columns ($F=2.76$, $p<0.10$).

(2) Managerial Opportunism

The self-serving reporting behavior of narcissistic CEOs in deploying rank-and-file options as a discretionary reporting instrument may also vary depending on the firm's pre-existing managerial opportunism environment. If rank-and-file option grants function as part of a broader self-serving financial reporting strategy, the association between CEO narcissism and grant magnitude should be most pronounced in firms where managerial opportunism is already evident. To test this mechanism, we partitioned the sample based on the sign of discretionary accruals (DA), with positive DA (DA＞0) capturing income-increasing earnings management and negative DA (DA＜0) capturing income-decreasing earnings management.[2] According to the results in Table 6, the regression coefficient for *Nar_CEO* in the DA＞0 group (Column 1) is 2.297 (t-value＝2.759), statistically significant at the 1% level in a positive direction, as expected. In contrast, for the DA＜0 group (Column 2), where managerial opportunism is less pronounced, the coefficient is 1.051 (t-value＝0.820) and loses its statistical significance entirely. These findings suggest that narcissistic CEOs' use of rank-and-file option grants intensifies precisely in firms already exhibiting income-increasing earnings management, where the discretionary fair-value estimation embedded in stock-based compensation can be deployed alongside other reporting levers. A Chow test likewise rejects the equality of the *Nar_CEO* coefficients across the two subsamples ($F=3.39$, $p<0.05$). These results are consistent with the view that rank-and-file option grants form part of a broader discretionary reporting strategy, complementing the reputation-cultivation evidence presented in Table 5. As with the employee-count partition, we interpret this analysis as a cross-sectional setting consistent with—rather than direct confirmation of—the reporting-discretion channel, since the sign of discretionary accruals may also correlate with broader firm characteristics.

〈Table 6〉 Cross-Sectional Analysis : Managerial Opportunism

	Dependent variable : RF_Option	
	(1)	(2)
Variables	DA＞0	DA＜0
Nar_CEO	2.297***	1.051
	(2.759)	(0.820)
Size	0.867***	0.589
	(3.148)	(1.475)

2) Discretionary accruals are estimated using modified Jones model following Dechow et al. (1995).

〈Table 6〉 Cross-Sectional Analysis : Managerial Opportunism (continued)

	Dependent variable : RF_Option	
	(1)	(2)
Variables	DA>0	DA<0
Lev	−0.541	−0.712
	(−0.882)	(−0.911)
Liq_Const	1.293	2.403
	(1.621)	(1.644)
Loss	2.385***	2.413***
	(3.265)	(3.100)
MTB	−0.020	−0.016
	(−1.086)	(−0.679)
ROA	2.488	5.229
	(0.862)	(1.513)
CFO	4.023	0.905
	(1.204)	(0.198)
Sale	−1.095***	−0.891**
	(−3.785)	(−2.162)
R&D	23.245***	14.337***
	(8.012)	(4.232)
Cash	1.399	0.362
	(1.501)	(0.315)
Constant	2.965***	4.847***
	(3.592)	(3.728)
Industry FE	yes	yes
Year FE	yes	yes
Observations	2,358	1,408
Adj R^2	0.163	0.180

Note : This table reports the results of additional analyses examining whether the main results differ depending on the sign of discretionary accruals, estimated using the modified Jones model (Dechow et al. 1995). Column (1) reports the results for the subsample of firms with positive discretionary accruals (DA>0), while Column (2) reports the results for the subsample of firms with negative discretionary accruals (DA<0). t-values are reported in parentheses. Industry and year fixed effects are included. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. A Chow test rejects the equality of the Nar_CEO coefficients across the two columns (F=3.39, p<0.05).

(3) Analyst Following

If narcissistic CEOs use rank-and-file option grants partly to cultivate an image of generosity, the reputational payoff should be greater when the firm's actions are more visible to external audiences. Narcissists require a continuous supply of external admiration to sustain their inflated self-views, and their self-enhancing behaviors intensify when performance is publicly observable and offers an opportunity for glory (Wallace & Baumeister, 2002). Consistent with this audience-seeking tendency, narcissistic CEOs are more likely to pursue salient, attention-generating initiatives such as prominent corporate social responsibility programs (Petrenko et al., 2016), and broad-based option grants share this character as visible gestures of generosity toward employees. For such gestures to yield reputational returns, however, they must reach an external audience. Financial analysts serve as a key channel through which firm actions are disseminated to investors and subjected to external scrutiny (Chen et al., 2015). Analyst coverage amplifies such visibility : broad-based option programs at heavily covered firms are more likely to be discussed in analyst reports, media coverage, and investor communications. We therefore partition the sample by the median number of analysts following the firm. As reported in Table 7, the coefficient on *Nar_CEO* is positive and significant in the high-coverage subsample (2.130, t=2.454) but insignificant in the low-coverage subsample (1.271, t=1.286). This pattern is consistent with the external-visibility dimension of the reputation-cultivation channel.

〈Table 7〉 Cross-Sectional Analysis : Analyst Following

	Dependent variable : RF_Option	
Variables	(1) Num_Analyst_High	(2) Num_Analyst_Low
Nar_CEO	2.130**	1.271
	(2.454)	(1.286)
Size	1.002***	0.803**
	(3.810)	(2.449)
Lev	−0.557	−1.169*
	(−1.001)	(−1.724)
Liq_Const	0.747	0.852
	(0.897)	(0.932)
Loss	1.762***	3.014***
	(2.943)	(3.753)

〈Table 7〉 Cross-Sectional Analysis : Analyst Following (continued)

	Dependent variable : RF_Option	
Variables	(1) Num_Analyst_High	(2) Num_Analyst_Low
MTB	−0.018 (−1.110)	−0.019 (−0.883)
ROA	0.745 (0.339)	5.621** (2.074)
CFO	0.669 (0.253)	3.127 (0.960)
Sale	−1.178*** (−4.269)	−0.999*** (−2.998)
R&D	16.882*** (6.253)	24.218*** (7.751)
Cash	0.764 (0.883)	1.471 (1.436)
Constant	3.162*** (3.525)	3.290*** (3.110)
Industry FE	yes	yes
Year FE	yes	yes
Observations	2,294	2,092
Adj R^2	0.163	0.191

Note : This table reports the results of additional cross-sectional analyses examining whether the main results differ depending on analyst following. Column (1) reports the results for the subsample of firms above the median number of analysts following the firm (Num_Analyst_High), while Column (2) reports the results for the subsample of firms below the median (Num_Analyst_Low). t-values are reported in parentheses. Industry and year fixed effects are included. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

4. Robustness Tests

(1) Entropy Balancing Approach

To test whether the observed increase in rank-and-file option grants stems directly from CEO narcissism or from systematic differences in observable characteristics, we employ the Entropy Balancing technique (Hainmueller, 2012). This approach addresses potential endogeneity and

selection bias by ensuring that firms led by narcissistic CEOs are comparable to those led by non-narcissistic CEOs. First, we convert the level of CEO narcissism into a dummy variable equal to one if *Nar_CEO* exceeds the sample median (treatment group, N=2,219) and zero otherwise (control group, N=2,225). We then apply the balancing algorithm to align the distributional moments—specifically the mean, variance, and skewness—of the treatment and control groups across all observable covariates.

As shown in Panel A of Table 8, after applying the entropy balancing algorithm, the mean values of the treatment and control groups become almost perfectly aligned across all covariates—including firm size (8.053 vs. 8.053), leverage (0.285 vs. 0.285), profitability (ROA : 0.063 vs. 0.063), and sales (7.800 vs. 7.800)—while the variance and skewness moments also align closely. This indicates that we successfully controlled for observable heterogeneity between the two groups. Panel B presents the results of the multivariate regression analysis re-estimated using the newly weighted sample. The regression coefficient for the treatment effect, *Nar_CEO*, is 1.806 (t-value=2.677), remaining statistically significant at the 1% level in a positive direction with an adjusted R^2 of 0.172, fully consistent with our baseline results. These findings suggest that our primary results are not driven by selection bias arising from differences in observable firm characteristics, reinforcing the robustness of our conclusions.

〈Table 8〉 Entropy-Balancing Approach

[Panel A] Post-entropy balancing covariate balance

	Mean		Variance		Skewness	
Variables	Treat (Nar_CEO >median)	Control (Nar_CEO <median)	Treat (Nar_CEO >median)	Control (Nar_CEO <median)	Treat (Nar_CEO >median)	Control (Nar_CEO <median)
Size	8.053	8.053	2.268	2.572	0.291	0.340
Lev	0.285	0.285	0.057	0.054	1.261	1.183
Liq_Const	0.037	0.037	0.035	0.035	4.943	4.943
Loss	0.059	0.059	0.056	0.056	3.742	3.742
MTB	3.254	3.254	37.260	43.020	0.516	0.297
ROA	0.063	0.063	0.006	0.006	−0.080	−0.182
CFO	0.106	0.106	0.005	0.005	0.074	0.066
Sale	7.800	7.800	1.984	2.317	0.212	0.197
R&D	0.030	0.030	0.004	0.003	2.981	2.838
Cash	0.160	0.160	0.034	0.029	1.873	1.845
Observations	2,219	2,225	2,219	2,225	2,219	2,225

〈Table 8〉 Entropy-Balancing Approach (continued)

[Panel B] Entropy-Balanced Sample Regression	
	Dependent variable : RF_Option
Variables	(1)
Nar_CEO	1.806***
	(2.677)
Size	0.943***
	(4.693)
Lev	−0.911*
	(−1.892)
Liq_Const	1.146
	(1.412)
Loss	2.091***
	(3.399)
MTB	−0.017
	(−1.473)
ROA	2.827
	(1.211)
CFO	1.404
	(0.588)
Sale	−1.099***
	(−5.320)
R&D	23.023***
	(6.196)
Cash	1.267
	(1.279)
Constant	2.935***
	(4.239)
Industry FE	yes
Year FE	yes
Observations	4,444
Adj R^2	0.172

Note : This table reports the results of re-estimating our main model using an entropy balancing approach. Panel A reports the covariate balance following entropy balancing. Panel B reports the re-estimated results of our main model using the entropy-balanced sample. t-values are reported in parentheses. Industry and year fixed effects are included. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

(2) Alternative Measures

In this subsection, we assess the sensitivity of our results to alternative measurement choices for both the dependent and independent variables. In untabulated analyses, we further re-estimate the baseline model using an alternative, portfolio-based measure of rank-and-file options following Call et al. (2016) : the number of unvested options held by rank-and-file employees- computed as the sum of options granted in the current year plus 0.75, 0.5, and 0.25 times options granted one, two, and three years prior, respectively-scaled by shares outstanding (*PF_Portfolio*). The coefficient on *Nar_CEO* remains positive and significant (0.002, t=1.699), indicating that our inference is robust to using a stock-based rather than flow-based measure of rank-and-file option compensation. With respect to the measurement of CEO narcissism, prior research has employed alternative proxies such as photograph prominence in annual reports and CEO signature size (Chatterjee & Hambrick, 2007 ; Ham et al., 2018). We rely on the earnings-call-based linguistic measure because it can be constructed consistently at scale, whereas these alternatives require hand-collected data unavailable for a panel of this size ; we discuss this limitation further in Section 5.

(3) Additional Control Variables

To mitigate concerns regarding omitted variable bias, we re-estimated the regression models by including additional control variables that may influence rank-and-file option grants, such as executive incentive structure, blockholder monitoring, and the external information environment.[3] As presented in Table 9, even after introducing executive risk-taking incentives (*Top5_Delta* and *Top5_Vega*) in Column 1, blockholder ownership in Column 2, and analyst coverage in Column 3, the coefficients for *Nar_CEO* remain robust in both direction and magnitude (1.319, 1.323, and 1.737) at the 5% and 1% significance levels, respectively. The adjusted R^2 values (0.192, 0.173, 0.174) are also comparable to or slightly higher than the baseline specification, indicating that the inclusion of these additional controls does not materially erode the explanatory power of CEO narcissism.

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3) Top5_Delta measures the sensitivity of the top five executives' option portfolio value to a 1% change in stock price, calculated following Core and Guay (2002) and Coles et al. (2006). Top5_Vega measures the sensitivity of the top five executives' option portfolio value to a 1% change in stock return volatility, calculated following Core and Guay (2002) and Coles et al. (2006). Blockholder ownership is obtained from Schwartz-Ziv and Volkova (2025). The number of analyst following is obtained from the I/B/E/S dataset.

〈Table 9〉 Additional Control Variables

	Dependent variable : RF_Option		
Variables	(1) Delta_Vega	(2) Blockholder	(3) Analyst Coverage
Nar_CEO	1.319**	1.323**	1.737***
	(2.092)	(2.049)	(2.672)
Size	0.535***	0.860***	0.930***
	(2.674)	(4.191)	(4.488)
Lev	−0.452	−0.952**	−0.921**
	(−1.078)	(−2.206)	(−2.140)
Liq_Const	0.994*	1.217**	1.077*
	(1.682)	(2.028)	(1.761)
Loss	2.048***	2.347***	2.428***
	(4.382)	(4.905)	(5.010)
MTB	−0.020	−0.020	−0.019
	(−1.601)	(−1.504)	(−1.470)
ROA	2.491	2.956*	3.736**
	(1.501)	(1.723)	(2.188)
CFO	−0.162	1.729	1.745
	(−0.081)	(0.845)	(0.850)
Sale	−1.086***	−1.098***	−1.113***
	(−5.252)	(−5.177)	(−5.261)
R&D	18.194***	19.164***	20.681***
	(9.212)	(9.509)	(10.140)
Cash	0.493	0.899	1.051
	(0.769)	(1.381)	(1.593)
Top5_Delta	0.001***		
	(5.083)		
Top5_Vega	0.006***		
	(11.671)		
Blockholder Ownership		0.005	
		(0.763)	
Analyst Coverage			−0.005
			(−0.370)
Constant	4.721***	3.659***	3.214***
	(7.307)	(4.895)	(4.856)
Industry FE	yes	yes	yes
Year FE	yes	yes	yes
Observations	4,429	4,305	4,389
Adj R^2	0.192	0.173	0.174

Note : This table presents the results of re-estimating our main model with additional control variables. Column (1) reports the results with the additional controls for the delta and vega of the top five executives' option portfolios (Top5_Delta and Top5_Vega). Column (2) reports the results with the additional control for blockholder ownership. Column (3) reports the results with the additional control for analyst coverage. Industry and year fixed effects are included. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

(4) Additional CEO Characteristics and Firm Fixed Effects

Our baseline results could reflect CEO attributes correlated with narcissism rather than narcissism itself. To address this concern, Column (1) of Table 10 augments the baseline model with controls for CEO age (the natural logarithm of the CEO's age), CEO tenure, CEO gender (an indicator equal to one for male CEOs), and CEO overconfidence, measured following Schrand and Zechman (2012). The coefficient on *Nar_CEO* remains positive and significant (1.417, t= 2.162), suggesting that the relation is not attributable to these correlated CEO characteristics. In addition, because unobservable time-invariant firm characteristics could jointly influence CEO communication style and compensation policy, Column (2) replaces industry fixed effects with firm fixed effects. The coefficient on *Nar_CEO* remains positive and significant (2.828, t=1.689), indicating that within-firm variation in CEO narcissism is associated with variation in rank-and-file option grants.

〈Table 10〉 Robustness Test : Additional CEO Characteristics and Firm Fixed Effects

	Dependent variable : RF_Option	
	CEO characteristics	Firm FE
Variables	(1)	(2)
Nar_CEO	1.417**	2.828*
	(2.162)	(1.689)
Size	1.083***	−0.098
	(5.276)	(−0.316)
Lev	−0.843*	0.472
	(−1.822)	(1.201)
Liq_Const	1.322**	−0.275
	(2.174)	(−0.733)
Loss	2.421***	−0.298
	(5.044)	(−1.031)
MTB	−0.014	−0.029***
	(−1.085)	(−3.519)
ROA	3.271*	−0.058
	(1.919)	(−0.057)
CFO	2.319	−3.213**
	(1.131)	(−2.216)
Sale	−1.158***	−1.863***
	(−5.441)	(−5.310)

〈Table 10〉 Robustness Test : Additional CEO Characteristics and Firm Fixed Effects (continued)

	Dependent variable : RF_Option	
	CEO characteristics	Firm FE
Variables	(1)	(2)
R&D	19.655***	5.156*
	(9.678)	(1.764)
Cash	0.801	−0.059
	(1.210)	(−0.098)
CEO_age	−3.205***	
	(−3.296)	
CEO_tenure	0.084***	
	(6.202)	
CEO_gender	1.072***	
	(2.589)	
Overconfidence	0.203	
	(0.716)	
Constant	14.013***	17.940***
	(3.550)	(11.544)
Industry FE	yes	no
Firm FE	no	yes
Year FE	yes	yes
Observations	4,399	4,444
Adj R^2	0.180	0.642

Note : This table presents additional robustness analyses of the relation between CEO narcissism and rank-and-file stock option grants. Column (1) includes additional controls for CEO characteristics : CEO age, tenure, gender, and overconfidence. CEO_age is measured as the natural logarithm of the CEO's age. CEO_tenure is measured as the CEO's tenure. CEO_gender is an indicator variable equal to one for male CEOs and zero for female CEOs. Overconfidence is measured following Schrand and Zechman (2012). Column (2) replaces industry fixed effects with firm fixed effects in the main regression specification. t-values are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

(5) CEO Turnover and Changes in Narcissism

To provide additional evidence on concerns about omitted firm characteristics and CEO-firm matching, we examine CEO turnover events, which introduce changes in CEO narcissism within the same firm (Sunder et al., 2017). Our sample includes 306 firms that experience CEO turnover ; for firms with multiple turnovers, we focus on the first event. We classify turnovers into cases

in which the incoming CEO exhibits a higher narcissism score than the outgoing CEO and cases in which the score is lower, and we re-estimate the baseline model over the post-turnover period for each subsample. As reported in Table 11, the coefficient on *Nar_CEO* is positive and significant only when narcissism increases following turnover (6.298, t=2.115) and is insignificant when it decreases (−1.139, t=−0.679). This asymmetric pattern is consistent with a CEO-level interpretation of our findings, as the firm remains the same across the turnover event. We acknowledge, however, that this design compares post-turnover subsamples rather than fully exploiting within-firm variation in a firm-CEO fixed effects or difference-in-differences framework ; accordingly, we interpret the turnover analysis as providing supplementary, rather than definitive, evidence against explanations based on time-invariant firm characteristics or CEO -firm matching.

〈Table 11〉 Additional Analysis : CEO Turnover and Changes in Narcissism Score

	Dependent variable : RF_Option	
Variables	(1) Increases in *Nar_CEO* after turnover	(2) Decreases in *Nar_CEO* after turnover
Nar_CEO	6.298**	−1.139
	(2.115)	(−0.679)
Size	0.552	0.678
	(0.563)	(1.596)
Lev	5.324***	−2.657***
	(2.740)	(−2.978)
Liq_Const	2.878	0.545
	(0.785)	(0.345)
Loss	1.823	0.851
	(0.696)	(0.766)
MTB	−0.038	−0.068**
	(−0.834)	(−2.423)
ROA	16.937**	4.109
	(2.302)	(1.145)
CFO	11.180	0.260
	(1.161)	(0.059)
Sale	−0.908	−0.587
	(−0.834)	(−1.324)

〈Table 11〉 Additional Analysis : CEO Turnover and Changes in Narcissism Score (continued)

Variables	*Dependent variable : RF_Option*	
	(1) Increases in *Nar_CEO* after turnover	(2) Decreases in *Nar_CEO* after turnover
R&D	5.920	−1.893
	(0.528)	(−0.419)
Cash	−7.728**	1.066
	(−2.026)	(0.659)
Constant	−0.038	2.755*
	(−0.012)	(1.890)
Industry FE	yes	yes
Year FE	yes	yes
Observations	201	602
Adj R^2	0.190	0.166

Note : This table presents additional analyses of the relation between CEO narcissism and rank-and-file stock option grants, conditional on changes in CEO narcissism following CEO turnover. Column (1) reports the results for the subsample of CEO turnover cases in which the incoming CEO has a higher narcissism score than the outgoing CEO. Column (2) reports the results for the subsample of CEO turnover cases in which the incoming CEO has a lower narcissism score than the outgoing CEO. t-values are reported in parentheses. Industry and year fixed effects are included. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Taken together, our cross-sectional analyses and robustness tests provide consistent support for our central hypothesis. The collective findings are consistent with the view that CEO narcissism—operationalized through self-referential linguistic signals in earnings calls—is associated with systematically larger stock option grants to rank-and-file employees, with the association amplified in settings where the reputational benefits to the CEO are most pronounced (a large workforce and high analyst coverage) and where managerial opportunism is most evident (income-increasing discretionary accruals).

Ⅴ. Conclusion

This study analyzes the effect of CEO narcissism on rank-and-file stock option grants of focal firms. Our findings reveal that a higher level of CEO narcissism, measured through self-referential linguistic signals in earnings call transcripts, is significantly associated with a larger magnitude of stock options awarded to non-executive employees. This result is consistent with our central hypothesis that narcissistic CEOs deploy rank-and-file options as a low-cost, high-visibility instrument that simultaneously cultivates admiration from a broad internal audience and expands the discretionary fair-value estimation latitude embedded in stock-based compensation, both of which can serve the CEO's personal objectives. Notably, this phenomenon is more pronounced in firms with a larger employee base, where the audience for symbolic generosity is widest, in firms with high analyst coverage, where external visibility is greatest, and in firms exhibiting income-increasing earnings management, where pre-existing managerial opportunism amplifies reporting discretion. This study contributes new scholarly evidence to the literature by bridging the previously disconnected streams of rank-and-file option determinants and consequences, and by extending the upper-echelons perspective into a compensation domain that has been systematically overlooked. Furthermore, our research offers critical policy and practical implications : to monitor the potentially self-serving option granting associated with CEO personal dispositions and to safeguard the integrity of broad-based equity compensation, boards must establish robust monitoring mechanisms over CEO discretion in rank-and-file pay decisions and reinforce scrutiny over fair-value estimation in stock-based compensation.

Our study is subject to several limitations. First, despite entropy balancing, firm fixed effects, and the CEO turnover analysis, we cannot fully rule out endogeneity ; in particular, we were unable to identify a valid instrument for a stable personality trait such as narcissism, and our findings should therefore be interpreted as robust associations rather than definitive causal estimates. Second, because grant-date fair values of options awarded to non-executive employees are not separately available, our dependent variable is based on the number of options granted scaled by shares outstanding rather than on fair values. Third, our narcissism proxy, while well validated in prior research, captures one linguistic dimension of the construct ; alternative proxies such as photograph prominence or signature size require hand-collected data that are unavailable at scale for our sample. Finally, larger rank-and-file grants do not necessarily imply inefficient compensation design, and future research could examine the ex post consequences of narcissism-driven grants for employee retention and firm value.

"The study in this manuscript has been conducted in accordance with the Ethical Guidelines set forth by the Korean Academic Society of Taxation."
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Appendix A. Variable Definitions

Variables	Definitions
Dependent variables	
RF_Option	The number of stock options granted to rank-and-file employees-total options granted less options granted to top executives and non-executive managers-scaled by the number of shares outstanding and multiplied by 1,000, following Call et al. (2016).
Independent variable	
Nar_CEO	CEO narcissism proxy, measured as the ratio of first-person singular pronouns ("I," "me," "my," "mine," "myself") to total first-person pronouns (singular and plural) used by the CEO during the Q&A portion of earnings conference calls.
Control variables	
Size	The natural logarithm of firm's total assets.
Lev	Total liabilities divided by total assets.
Liq_Const	Dummy variable equals one if firm's operating cash flow is negative, and zero otherwise.
Loss	Dummy variable equals one if net income is negative, and zero otherwise.
MTB	Market value divided by book value in fiscal year *t*.
ROA	Operating income divided by total assets at the beginning of the fiscal year.
CFO	Operating cash flow divided by total assets at the beginning of the fiscal year.
Sale	The natural logarithm of firm's total sales.
R&D	The total R&D expense divided by total assets at the beginning of the fiscal year.
Cash	The amount of cash divided by total assets at the beginning of the fiscal year.
Variables used in cross-sectional and additional analyses	
DA	Discretionary accruals, estimated using the modified Jones model following Dechow et al. (1995).
Number of Employees	The number of employees, obtained from Compustat.
Analyst Coverage	The number of analysts following the firm, obtained from the I/B/E/S dataset.
Top5_Delta	The sensitivity of the top five executives' option portfolio value to a 1% change in stock price, calculated following Core and Guay (2002) and Coles et al. (2006).
Top5_Vega	The sensitivity of the top five executives' option portfolio value to a 1% change in stock return volatility, calculated following Core and Guay (2002) and Coles et al. (2006).

	Definitions
Blockholder Ownership	The percentage of shares held by blockholders, obtained from Schwartz-Ziv and Volkova (2025).
CEO_age	The natural logarithm of the CEO's age.
CEO_tenure	The CEO's tenure in years.
CEO_gender	An indicator variable equal to one for male CEOs, and zero otherwise.
Overconfidence	CEO overconfidence, measured following Schrand and Zechman (2012).