

The moderating effect of CEO narcissism on pay-performance sensitivity

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Received on 04/07/2023 – Desk acceptance on 05/22/2023 – 3rd version approved on 12/22/2023

Editor-in-Chief: Andson Braga de Aguiar

Associate Editors: Márcia Mártins Mendes De Luca and Eduardo da Silva Flores

ABSTRACT

This study aims to examine whether the Chief Executive Officer (CEO) narcissism has a moderating effect on pay-performance sensitivity. We fill a gap in the existing literature, which overlooks the behavioral aspects of agents in the design of executive compensation plans, by providing evidence of the moderating effect of CEO narcissism on pay-performance sensitivity. We shed light on the fact that shareholders and potential investors might face higher agency costs when investing in firms led by narcissistic CEOs, considering that narcissistic CEOs tend to receive higher levels of compensation than their peers, regardless of the company's performance. This study also has implications for board members and recruiters, who may take this psychological aspect into account when proposing compensation schemes to CEOs. The results extend the prior discussion on low pay-performance sensitivity (or its non-significance) by suggesting that this might be partially attributed to the psychological characteristics of CEOs, which play a role in the design of executive compensation. A sample of 1,057 non-financial U.S. firms (8,869 firm-year observations) during the period 2002-2018 was analyzed using system generalized method of moments (GMM-SYS) regressions due to the endogenous relationship between CEO compensation and firm performance. The main results show that CEO narcissism reduces the association between CEO compensation and firm performance, supporting the prediction that narcissism can be viewed as a "dark side" in the design of executive compensation plans. This finding is robust to alternative measures of pay-performance sensitivity, and further robustness checks indicate that our results are not driven by CEO overconfidence. Therefore, this study contributes to the literature by providing, to the best of our knowledge, the first empirical evidence of the moderating effect of CEO narcissism on pay-performance sensitivity.

Keywords: corporate governance, pay-performance sensitivity, CEO narcissism, personality traits.

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This is a bilingual text. This article has also been translated into Portuguese and published under the DOI <https://doi.org/10.1590/1808-057x20241909.pt>

This article stems from a Ph.D. thesis submitted by the co-author, Yuri Gomes Paiva Azevedo, in 2022.

Study presented at the XIV Anpcont Congress, Foz do Iguaçu, PR, Brazil, June 2020.



O efeito moderador do narcisismo do CEO na sensibilidade da remuneração ao desempenho

RESUMO

O objetivo deste estudo é examinar se o narcisismo do Diretor Executivo (Chief Executive Officer – CEO) tem um efeito moderador sobre a sensibilidade remuneração-desempenho (pay-performance sensitivity). Preenchemos uma lacuna na literatura existente, que ignora os aspectos comportamentais dos agentes na elaboração dos planos de remuneração dos executivos, fornecendo evidências do efeito moderador do narcisismo do CEO sobre a sensibilidade remuneração-desempenho. Esclarecemos o fato de que os acionistas e os investidores potenciais podem enfrentar custos de agência mais altos ao investir em empresas lideradas por CEOs narcisistas, considerando que os CEOs narcisistas tendem a receber níveis mais altos de remuneração do que seus pares, independentemente do desempenho da empresa. Este estudo também tem implicações para os membros do conselho e recrutadores, que podem levar em conta esse aspecto psicológico ao propor esquemas de remuneração aos CEOs. Os resultados estendem a discussão anterior sobre a baixa sensibilidade remuneração-desempenho (ou sua não significância), sugerindo que isso pode ser parcialmente atribuído às características psicológicas dos CEOs, que desempenham um papel na concepção da remuneração dos executivos. Uma amostra de 1.057 empresas não financeiras dos EUA (8.869 observações empresa-ano) durante o período de 2002 a 2018 foi analisada usando regressões do método generalizado de momentos sistêmico (system generalized method of moments – SYS-GMM) devido à relação endógena entre a remuneração do CEO e o desempenho da empresa. Os principais resultados mostram que o narcisismo do CEO reduz a associação entre a remuneração do CEO e o desempenho da empresa, corroborando a previsão de que o narcisismo pode ser visto como um “lado sombrio” na elaboração de planos de remuneração de executivos. Essa constatação é robusta em relação a medidas alternativas de sensibilidade remuneração-desempenho, e outros testes de robustez indicam que nossos resultados não são motivados pelo excesso de confiança do CEO. Portanto, este estudo contribui para a literatura ao fornecer, até onde sabemos, as primeiras evidências empíricas do efeito moderador do narcisismo do CEO sobre a sensibilidade remuneração-desempenho.

Palavras-chave: governança corporativa, pay-performance sensitivity, narcisismo do CEO, traços de personalidade.

1. INTRODUCTION

Executive compensation schemes tied to firm performance are commonly used as a corporate governance mechanism to align the interests of managers and shareholders (Jensen & Meckling, 1976; Jensen & Murphy, 1990). However, previous research on pay-performance sensitivity suggests that there is no consistent and robust relationship between executive compensation and firm performance (Aguinis et al., 2018; Tosi et al., 2000; Van Essen et al., 2015). Thus, given that moderating factors might reveal effects that would otherwise go undetected (Plöckinger et al., 2016), this study investigates whether Chief Executive Officer (CEO) narcissism has a moderating effect on pay-performance sensitivity.

Three drivers motivated the present study. First, research suggests that individual differences and characteristics of CEOs, such as narcissism, may shed light on the inconsistent relationship between firm performance and CEO compensation (Aguinis et al., 2018; Capezio et al., 2011). By examining the role of CEO narcissism in the pay-performance relationship, this study seeks to fill a gap in the literature and better understand the factors that shape executive compensation and firm

performance, with implications for the updated version of the Upper Echelons Theory (Hambrick, 2007), which calls for research on the combined effects of executives' personality traits and compensation systems.

Second, although previous research has documented that CEO overconfidence increases pay-performance sensitivity (Humphery-Jenner et al., 2016), it is not clear whether CEO narcissism moderates the relationship between CEO compensation and firm performance. Hence, considering that narcissism and overconfidence are theoretically distinct, since overconfidence relates only to the perception of reality, whereas narcissism is a complete personality trait that describes both cognition and behavior (Aktas et al., 2016), this study also fills a gap in the literature by depicting the dynamics between CEO personality traits, such as narcissism, and pay-performance sensitivity.

Third, the practical literature posits that narcissistic CEOs can harm the companies they lead. In contrast to humble leaders, who are generous, narcissists are selfish and tend not to financially reward and promote high performers, thereby leading to lower engagement and

productivity among those they supervise (Beheshti, 2018). Thus, given the lack of empirical evidence on the effect of CEO narcissism on the pay-performance relationship, we believe it is relevant to investigate the role of this dark personality trait, as narcissistic CEOs might believe they deserve to receive higher levels of compensation regardless of poor firm performance, which could be driven by low-productivity employees.

Drawing on Upper Echelons Theory, which posits that psychological characteristics of top executives are determinants of strategic choices (e.g., compensation systems and structure) and, through these choices, organizational performance (Hambrick & Mason, 1984; Hambrick, 2007), we hypothesize that CEO narcissism reduces the association between CEO compensation and firm performance. In summary, we expect that narcissistic CEOs may use their beliefs about their superior qualities regarding competence, intelligence, and leadership abilities to convince the board of directors to compensate them with proportionally larger fixed amounts, including signing bonuses and indirect compensation, rather than variable compensation. After all, narcissistic CEOs might believe that their superiority does not need to be put to the test with performance-based compensation. With a higher proportion of fixed compensation, narcissistic CEOs tend not to have total compensation that is strongly linked to company performance.

To examine the moderating effect of CEO narcissism on pay-performance sensitivity, we estimate system generalized method of moments (SYS-GMM) regressions due to the simultaneous relationship between firm performance and executive compensation. Our sample includes 1,057 non-financial U.S. firms (8,869 firm-year observations), during the period 2002-2018, with data from Compustat Executive Compensation (ExecuComp), the Center for Research in Security Prices (CRSP), Compustat, and Thomson Reuters Eikon. We believe it is relevant to highlight that although we use the Thomson Reuters Eikon database to obtain data on CEO narcissism, both the data collection process and the data treatment process are carried out manually. Thus, all of these procedures are cross-checked to ensure the reliability and accuracy of the collected data.

Our overall results indicate that CEO narcissism negatively moderates the association between CEO compensation and firm performance. Therefore, CEO narcissism can be viewed as a “dark side” that reduces pay-performance sensitivity and does not reflect recommended corporate governance practices. This finding is robust to alternative measures of pay-performance sensitivity, and

although it is theoretically well established that narcissism and overconfidence are different concepts, we also conduct a supplemental analysis to disentangle the effect of CEO narcissism and CEO overconfidence, which confirms that our results are not driven by CEO overconfidence.

We contribute to the existing literature in the following ways. First, to the best of our knowledge, we provide the first empirical evidence of the moderating effect of CEO narcissism on pay-performance sensitivity, considering that much of the current literature on executive compensation ignores agent behavioral aspects of the design of executive compensation plans (Aguinis et al., 2018). This contribution extends the previous literature on CEO narcissism and executive compensation, which does not explore whether CEO narcissism might misalign CEO interests in higher levels of compensation with shareholder interests in better firm performance (O’Reilly et al., 2014; Ham et al., 2018).

Second, we shed light on the “dark side” effect of CEO narcissism in reducing the propensity to align CEO compensation with firm performance. Although existing studies have examined whether this dark personality trait is associated with decision-making under conditions of uncertainty and risk (D’Souza & Lima, 2021), perceptions of dishonesty (Avelino et al., 2017; Avelino & Lima, 2017), tax avoidance (Araújo et al., 2021), power-seeking (D’Souza et al., 2019b), and earnings manipulation (D’Souza et al., 2019a), it is not clear whether narcissism is associated with pay-performance sensitivity. Thus, this study provides additional empirical evidence of the “dark side” of narcissism in the design of executive compensation.

Third, we also contribute to the existing literature that calls for research to examine the role of psychological and observable characteristics of CEOs in the design of compensation mechanisms (Aguinis et al., 2018; Capezio et al., 2011). Therefore, we extend the discussion on the low positive pay-performance sensitivity (or its non-significance) documented in the previous literature (Aguinis et al., 2018; Jensen & Murphy, 1990; Ozkan, 2011; Tosi et al., 2000; Van Essen et al., 2015), suggesting that this may be partially attributed to the psychological characteristics of CEOs.

As a practical implication, this study contributes to shareholders by showing that CEO narcissism reduces the propensity to align managers’ interests in higher levels of compensation with investors’ interests in better firm performance. In this sense, shareholders might expect higher agency costs when investing in firms led by narcissistic CEOs, considering that narcissistic CEOs tend

to receive higher levels of compensation than their peers, regardless of the company's performance. This behavior tends to reduce shareholder wealth, since narcissistic CEOs will continue receiving higher levels of compensation even during "bad times."

This study could also be useful for board members and recruiters, who can take this psychological aspect into account when proposing compensation schemes to CEOs. In this regard, we argue that the psychological assessment of CEOs is important not only when defining compensation mechanisms, but also when hiring them, as narcissism could undermine the expected effectiveness

2. HYPOTHESIS DEVELOPMENT

CEOs represent the highest authority in the corporate hierarchy (Urban, 2019), holding a position of power that allows them to directly influence corporate strategy and outcomes. In this sense, considering that CEOs are aware of weaknesses in the corporate governance structure and internal controls — which allows them to maneuver controls — there is a growing interest in how CEO characteristics, such as CEO narcissism, could influence the firm's policies and decisions (Smith et al., 2017).

This concept that the decision-maker brings a cognitive base and values to strategic decisions is proposed in the Upper Echelons Theory by Hambrick and Mason (1984), and further updated by Hambrick (2007). The core of the Upper Echelons Theory is that the psychological and observable characteristics of top executives are determinants of strategic choices (e.g., compensation systems and structure) and, through these choices, organizational performance (Hambrick & Mason, 1984; Hambrick, 2007).

On the cognitive side, narcissism entails a belief in superior qualities, in which narcissists rate themselves highly on an array of agentic dimensions, such as competence, intelligence, and leadership abilities (Chatterjee & Hambrick, 2011; D'Souza et al., 2018; Gruda et al., 2021). On the motivational side, narcissism carries with it an intense need to reaffirm superiority (Avelino & Lima, 2017; Campbell et al., 2004), which could be accomplished through a leadership position, such as CEO (Avelino et al., 2017; D'Souza et al., 2019b). More importantly, however, this reinforcement of self-importance comes from others in the form of constant attention, admiration, and applause (D'Souza & Lima, 2021).

of these mechanisms. Hence, it is important for boards and recruiters to fine-tune compensation contracts to align with CEO personality traits, such as narcissism.

Finally, our results could have implications for employees. Considering that a strong pay-performance relationship signals a performance-driven culture, if CEOs weaken this link, it could impact the overall culture of the organization, as employees might perceive that their efforts are not adequately recognized and rewarded. As a result, the organization might face challenges in retaining top talent and attracting new skilled individuals.

Executive compensation can be seen as one way to reaffirm this superiority, since the high visibility of the compensation levels of top executives of public firms, including the CEO, makes the CEO's "worth" relative to other executives and also allows for easy comparison with other CEOs. Based on this view, O'Reilly et al. (2014) show that higher narcissistic CEOs receive more total compensation (i.e., salary, bonus, and stock options), have more money in their total shareholdings, and have larger discrepancies between their own compensation and that of other members of their team. This view is further supported by Ham et al. (2018), who provide evidence that narcissistic CEOs enjoy higher absolute and relative compensation.

Thus, it seems that one avenue overlooked by prior studies (O'Reilly et al., 2014; Ham et al., 2018) is the moderating role of CEO narcissism on pay-performance sensitivity. Therefore, this study addresses this gap in the literature by investigating whether narcissism can be framed as a "dark side" in the design of executive compensation that weakens the alignment between executive compensation and firm performance, thereby misaligning CEO interests in higher levels of compensation with shareholder interests in better firm performance.

Narcissism, along with Machiavellianism and psychopathy, is a component of the so-called dark triad (D'Souza et al., 2019a). In this regard, some characteristics and outcomes of narcissism could help explain why this dark personality trait could negatively moderate the association between CEO compensation and firm performance, suggesting that CEO narcissism can be viewed as a "dark side" in the design of executive compensation, as it reduces pay-performance sensitivity

and does not reflect recommended corporate governance practices.

First, narcissistic CEOs could be drawn to certain types of firms (e.g., financially distressed and/or underperforming firms that need to be turned around) and/or such firms may select narcissistic CEOs (Ham et al., 2018). In this sense, due to the narcissistic self-view of “I’m better than all the rest” (Gruda et al., 2021), which stems from their sense of grandiosity and superiority (D’Souza et al., 2018), narcissistic CEOs will tend to reduce the association between their compensation and firm performance because they might believe that they deserve higher levels of compensation for being better than their peers, regardless of firm performance.

Second, previous research shows that firms led by narcissistic CEOs are associated with lower financial productivity in the form of profitability and operating cash flows (Ham et al., 2018). In this context, if CEO compensation is closely aligned with firm performance, more narcissistic CEOs tend to receive lower levels of compensation than their peers due to their poor performance.

Third, the literature also highlights that narcissistic CEOs who have already performed poorly will be unsure of themselves and their organizations and reluctant to take risks (Chatterjee & Hambrick, 2011). Hence, considering

that aligning compensation with firm performance involves risk-taking, since firm performance might be influenced by factors beyond the CEO’s control (Aguinis et al., 2018), more narcissistic CEOs could reduce the association between their compensation and firm performance.

Fourth, when faced with inadequate performance, narcissistic CEOs tend to externalize this failure, typically blaming outside sources (Bergman et al., 2010). In this sense, considering that narcissistic CEOs are unable to take responsibility for the negative events that occur in their management (Reina et al., 2014) and also tend to prioritize their own self-interests over the interests of the firm (Kim et al. 2018), CEOs with higher levels of narcissism may tend to reduce the pay-performance sensitivity because they believe that they deserve to receive higher levels of compensation regardless of poor firm performance, which could be caused by other employees or external factors.

Hence, given that narcissism might act as a “dark side” in the design of executive compensation plans, as narcissistic CEOs may believe that their superiority does not need to be put to the test with performance-based compensation, we formulate the following hypothesis:

H₁: CEO narcissism reduces the association between CEO compensation and firm performance.

3. RESEARCH DESIGN

3.1 Data and Sample Selection

Our sample is based on firms listed on the U.S. stock market. Our initial sample consists of 2,752 U.S. public firms (30,828 firm-year observations) with available data between 2002 and 2018. We begin our sample in 2002 because the earnings release conference call transcripts needed to calculate CEO narcissism levels are not available in the Thomson Reuters Street Events database prior to that year.

Consistent with previous studies (Ataay, 2018; Capalbo et al., 2017), we exclude financial, insurance, and real estate firms (SIC 6000-6799) due to their specific financial and operating structures, which could cause distortions in the accounting-based performance measures. After the exclusion of firms with missing data, the final sample consists of 8,869 observations from 1,057 firms.

The variables used in this study are from the following sources. CEO compensation data are from Compustat

Executive Compensation (ExecuComp), market-based performance measures are from the Center for Research in Security Prices (CSRP), accounting-based performance measures are from Compustat, and CEO narcissism data are from earnings release conference call transcripts available from Thomson Reuters Eikon. We do not require company data in all years in order to avoid survival bias. Thus, our analyses are based on unbalanced data. Furthermore, to mitigate the influence of outliers in our sample, we winsorize the continuous variables at the 1st and 99th percentiles.

3.2 Empirical Model

Prior literature posits a simultaneous relationship between firm performance and executive compensation. On the one hand, the positive influence of firm performance on executive compensation may reduce potential agency conflicts (Ataay, 2018; Brandão et al., 2019; Gao & Li,

2015). On the other hand, executive compensation may act as a motivational mechanism, stimulating managers to achieve superior performance (Aguiar & Pimentel, 2017).

To address this simultaneity effect of firm performance and executive compensation, we run the baseline regression presented in Equation 1 through a SYS-GMM.

$$CEOComp = \beta_0 + \beta_1 Perf + \beta_2 Narc + \beta_3 Perf \times Narc + \sum_{j=4}^{11} \phi_j Controls + \mu \quad 1$$

The CEO compensation (*CEOComp*) measures are described in Section 3.2.1, firm performance (*Perf*) refers to the variables described in Section 3.2.2, and CEO narcissism (*Narc*) is our proxy for CEO narcissism described in Section 3.2.3. The interaction coefficient between firm performance and CEO narcissism (*Perf x Narc*) captures the moderating effect of CEO narcissism on the pay-performance relationship in order to test our hypothesis H₁.

3.2.1 CEO compensation measures

Following prior research on pay-performance sensitivity that uses both CEO cash compensation and CEO total compensation (Amzaleg et al., 2014; Capezio et al., 2011; Gao & Li, 2015) as proxies for CEO compensation (*CEOComp*), we employ two measures as our dependent variable. Our first measure of CEO compensation considers CEO cash compensation (*CEOCashComp*), composed by the logarithm of the sum of salaries, bonuses, and other cash payments. The log transformation is proposed to mitigate the problem of skewed distributions and to reduce the difference in scale with the other variables in Equation (1). The second measure of CEO compensation (*CEOTotComp*) is more complete than the first because it also includes the sum of the logarithms of the grant date value of restricted stock awards and the grant date Black-Scholes value of options granted.

3.2.2 Firm performance measures

Previous research shows that the inclusion of accounting-based measures in executive compensation contracts helps shield CEOs from fluctuations in stock prices (and, consequently, in the market-based measures) that are beyond their control (Sloan, 1993). However, the literature also suggests that accounting-based measures can be easily manipulated by CEOs, whereas it is more difficult to manipulate market-based measures for an extended period (Merhebi et al., 2006). In this sense,

considering that each firm performance measure has specific advantages (disadvantages), we employ both market-based and accounting-based measures to verify the robustness of our findings to alternative measures.

As a market-based performance measure, we use annual stock return (*RET*), measured by the total return over the holding period for a sale of a security on the date in question, taking into account and reinvesting all distributions to shareholders. As accounting-based performance measures, we use return on assets (*ROA*), measured by the ratio of operating income to total assets; return on equity (*ROE*), measured by the ratio of net income to total equity; return on sales (*ROS*), measured by the ratio of operating income to total sales; and earnings before interest, taxes, depreciation, and amortization (*EBITDA*), measured by the ratio of earnings before interest, taxes, depreciation, and amortization to total assets, given that EBITDA is a commonly used performance measure in setting executive compensation (Rozenbaum, 2019).

3.2.3 CEO narcissism measure

Personality traits exert an important influence on the attitudes and behaviors of executives, as well as on the linguistic markers that constitute the range of their discourse (D'Souza et al., 2018). Thus, in line with the extant literature in psychology, accounting, and finance (Aktas et al., 2016; Capalbo et al., 2018; Raskin & Shaw, 1988), we use the ratio of the use of first-person singular pronouns (I, me, my, mine, myself) to the total number of first- and third-person pronouns (I, me, my, mine, myself, we, us, our, ours, ourselves) in CEO speeches to capture narcissism as a personality trait, as described in Equation 2. The use of this unobtrusive measure is proposed and validated by Raskin and Shaw (1988), who show that individuals who scored higher on narcissism — measured by the NPI (Raskin & Hall, 1979) — tended to use more first-person singular pronouns.

$$Narcissism\ Score = \frac{\sum (I, me, my, mine, myself)}{\sum (I, me, my, mine, myself, we, us, our, ours, ourselves)} \quad 2$$

To calculate the narcissism score, we use natural language processing (NLP) via the Tokenizers package in RStudio, which counts the number of first-person pronouns for each CEO in each year, based on the transcripts for the fourth quarter results. This continuous measure of narcissism is consistent with the view that narcissism can be seen as a personality dimension on which individuals can score from low to high (Campbell et al., 2004; Capalbo et al., 2018; Raskin & Hall, 1979; Raskin & Shaw, 1988).

We believe it is important to highlight that although we use the Thomson Reuters Eikon database to obtain the CEO narcissism data, the collection procedure is manual (hand-collected). Thus, all these procedures are cross-checked to ensure the reliability and accuracy of the collected data.

First, we manually select a specific firm (only one firm per round) and filter the events in the Corporate Events

section by type in order to download the transcripts of the fourth quarter earnings conference call for each firm-year (only one year per round). Second, we manually edit each file in order to exclude the presentation section (which includes the formal speeches and earnings announcements, which might be scripted); to exclude the speech of everyone in the questions and answers (Q&A) session except the CEO; and to exclude transcripts in which the CEO is not present or does not respond to questions from analysts and investors.

3.2.4 Control variables

In our baseline model, we also include a set of control variables. In line with extant research on pay-performance sensitivity, we control for firm size, firm debt, firm growth, CEO ownership concentration, CEO duality, CEO turnover, and compensation committee. The definitions of the variables are presented in Table 1.

Table 1
Definition of variables

Variable	Definition	Source
<i>CEOCashComp</i>	Measure of CEO cash compensation, computed as the sum of the logarithms of salaries, bonuses, and other cash payments.	ExecuComp
<i>CEOTotComp</i>	Measure of CEO total compensation, computed as the sum of the logarithms of salaries, bonuses, the grant date value of restricted stock awards, and the grant date Black-Scholes value of options granted.	ExecuComp
<i>RET</i>	Measure of annual stock returns, computed as the total holding period return for a sale of a security on the date in question, taking into account and reinvesting all distributions to shareholders.	CSRP
<i>ROA</i>	Measure of return on assets, computed as the ratio of operating income to total assets.	Compustat
<i>ROE</i>	Measure of return on equity, computed as the ratio of net income to total equity.	Compustat
<i>ROS</i>	Measure of return on sales, computed as the ratio of operating income to total sales.	Compustat
<i>EBITDA</i>	Measure of earnings before interest, taxes, depreciation, and amortization, divided by total assets.	Compustat
<i>Narc</i>	Measure of CEO narcissism, computed as the ratio of the use of first-person singular pronouns to the total number of first- and third-person pronouns.	Thomson Reuters Eikon
<i>HighNarc</i>	Measure of high narcissism, computed as a dummy variable equal to 1 if a CEO is classified above the median, and 0 otherwise.	Thomson Reuters Eikon
<i>Size</i>	Measure of firm size, computed as the logarithm of total assets.	Compustat
<i>Debt</i>	Measure of debt, computed as the ratio of total debt to total assets.	Compustat
<i>Growth</i>	Measure of firm growth, computed as the change in net sales compared to net sales in $t-1$.	Compustat
<i>Ownership</i>	Measure of CEO ownership concentration, calculated as the number of CEO shares divided by the total number of shares outstanding.	ExecuComp
<i>Duality</i>	Measure of CEO duality, computed as a dummy variable equal to 1 if a CEO is chairman of the board, and 0 otherwise.	ExecuComp
<i>Turnover</i>	Measure of CEO turnover, computed as a dummy variable equal to 1 if a new CEO is appointed, and 0 otherwise.	ExecuComp
<i>Committee</i>	Measure of CEO presence on the committee that makes the firm's compensation decisions, computed as a dummy variable equal to 1 if a new CEO is appointed, and 0 otherwise.	ExecuComp

Source: Prepared by the authors.

4. RESULTS AND ANALYSES

4.1 Descriptive Statistics

Table 2 presents descriptive statistics for the variables used in our analyses. Before scaling by the sum of the logarithm of salaries, bonuses, and other cash payments, the mean dollar value of CEO cash compensation (*CEOCashComp*) is \$1,192 thousand, which is consistent with prior research conducted in the U.S. context (Gao & Li, 2015; Leone et al., 2006). Similarly, the mean dollar value of CEO total compensation (*CEOTotComp*) is \$7,725 thousand, supporting the increasing importance of stock awards and stock options in the U.S. context (Bettis et al., 2018).

Table 2
Descriptive analysis

	N	Mean	Std. Dev.	Min.	Max.
<i>CEOCashComp</i> (in thousands)	8,869	1,192	980	218	6870
<i>CEOTotComp</i> (in thousands)	8,869	7,725	8,732	3,313	55,339
RET	8,869	0.011	0.030	-0.082	0.110
ROA	8,869	0.093	0.079	-0.212	0.319
ROE	8,869	0.101	0.387	-2.181	1.819
ROS	8,869	0.054	0.125	-0.605	0.357
EBITDA	8,869	0.051	0.087	-0.297	0.277
Narc	8,869	0.234	0.102	0	0.530
Size (in millions)	8,869	10,824	2,283	0,010	149,244
Debt	8,869	0.545	0.217	0.092	1.216
Growth	8,869	0.076	0.196	-0.451	0.927
Ownership	8,869	0.012	0.033	0	0.2287
Duality	8,869	0.514	0.499	0	1
Turnover	8,869	0.129	0.336	0	1
Committee	8,869	0.002	0.051	0	1

Source: Prepared by the authors.

On average, the firms have low levels of shareholder return (*RET*), which is 1.1%. The mean of other financial performance proxies ranges between 5.1% (*EBITDA*) and 10.1% (*ROE*) and follows prior literature, such as the 9.3% of return on assets (*ROA*) documented by Leone et al. (2006). The mean narcissism score (*Narc*) is 0.23, which is similar to the findings of Aktas et al. (2016) and Capalbo et al. (2018), who report a mean narcissism score through first-person pronouns of 0.215 and 0.260, respectively. The minimum value indicates that some CEOs did not use first-person pronouns in

their speeches, whereas the maximum value indicates that some CEOs used more first-person pronouns than third-person pronouns.

Table 3 presents the Spearman correlation matrix coefficients due to the non-normality of the variables. As expected, we find that all performance measures are positively and statistically significantly correlated with CEO compensation measures. Thus, the overall results are consistent with previous research that reports a positive correlation between CEO compensation and firm performance (Ataay, 2018; Leone et al., 2006).

Table 3
Correlation matrix coefficients

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 <i>CEOCashComp</i>	1.000														
2 <i>CEOTotComp</i>	0.575	1.000													
3 <i>RET</i>	0.033	0.041	1.000												
4 <i>ROA</i>	0.190	0.251	0.088	1.000											
5 <i>ROE</i>	0.239	0.312	0.091	0.693	1.000										
6 <i>ROS</i>	0.187	0.301	0.070	0.765	0.589	1.000									
7 <i>EBITDA</i>	0.194	0.261	0.085	0.937	0.681	0.847	1.000								

Table 3
Cont.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8 <i>Narc</i>	0.055	0.047	-0.007	0.001	0.008	0.045	0.014	1.000							
9 <i>Size</i>	0.591	0.651	-0.045	0.023	0.200	0.195	0.046	0.063	1.000						
10 <i>Debt</i>	0.290	0.247	-0.031	-0.119	0.113	-0.038	-0.102	-0.015	0.468	1.000					
11 <i>Growth</i>	0.037	0.077	0.099	0.259	0.216	0.221	0.254	0.000	-0.077	-0.141	1.000				
12 <i>Ownership</i>	-0.207	-0.190	0.037	-0.032	-0.104	-0.145	-0.043	-0.047	-0.453	-0.165	0.077	1.000			
13 <i>Duality</i>	0.255	0.181	0.020	0.057	0.088	0.053	0.057	0.055	0.181	0.125	0.004	0.083	1.000		
14 <i>Turnover</i>	-0.111	-0.115	-0.037	-0.039	-0.036	-0.046	-0.045	-0.007	0.011	0.018	-0.074	-0.244	-0.179	1.000	
15 <i>Committee</i>	0.012	-0.024	0.029	-0.005	0.005	-0.021	-0.011	0.009	-0.013	-0.000	0.008	0.008	0.028	0.000	1

Note: Coefficients in bold are statistically significant at the 5% level.

Source: Prepared by the authors.

Our results also show that CEO compensation is positively and statistically significantly correlated with CEO narcissism, although the coefficients indicate that this correlation is very weak. However, previous research supports this weak correlation between CEO compensation and CEO narcissism, such as that of Ham et al. (2018), who report a correlation coefficient between these variables of 0.072.

Finally, we find that there is no high correlation between the independent and control variables included in the econometric models, which suggests that there is no evidence of multicollinearity. One exception is the strong correlation between the accounting-based performance measures (e.g., *ROA*, *ROE*, *ROS*, and

EBITDA). Thus, to avoid multicollinearity problems, we do not include them simultaneously in the econometric models.

4.2 Regression Analyses

Table 4 presents our baseline regression results (Equation 1) using CEO cash compensation (*CEOCashComp*) as our dependent variable. In column 1, we use annual stock returns (*RET*) as a proxy for firm performance. For robustness, columns 2-5 test return on assets (*ROA*), return on equity (*ROE*), return on sales (*ROS*), and earnings before interest, taxes, depreciation, and amortization (*EBITDA*) as proxies for firm performance.

Table 4
CEO cash compensation, firm performance, and narcissism score

	Dependent variable: <i>CEOCashComp</i>				
	1	2	3	4	5
<i>RET</i>	1.077** (0.442)				
<i>ROA</i>		0.559** (0.233)			
<i>ROE</i>			0.090* (0.052)		
<i>ROS</i>				0.277** (0.144)	
<i>EBITDA</i>					0.496*** (0.215)
<i>Narc</i>	0.082 (0.070)	0.207** (0.095)	0.096 (0.070)	0.129 (0.073)	0.113 (0.073)
<i>RET x Narc</i>	-2.737 (1.860)				
<i>ROA x Narc</i>		-1.657** (0.802)			
<i>ROE x Narc</i>			-0.378* (0.222)		
<i>ROS x Narc</i>				-1.269** (0.524)	

Table 4
Cont.

	Dependent variable: CEOCashComp				
	1	2	3	4	5
<i>EBITDA x Narc</i>					-1.435** (0.730)
<i>Size</i>	0.027 (0.027)	0.027 (0.026)	0.026 (0.027)	0.026 (0.026)	0.032 (0.027)
<i>Debt</i>	0.044 (0.073)	0.052 (0.073)	0.023 (0.072)	0.030 (0.072)	0.046 (0.074)
<i>Growth</i>	0.187*** (0.033)	0.168*** (0.034)	0.182*** (0.033)	0.108*** (0.027)	0.166*** (0.035)
<i>Ownership</i>	-1.004 (0.803)	-1.042 (0.797)	-1.031 (0.797)	0.186*** (0.033)	-1.055 (0.799)
<i>Duality</i>	0.037 (0.025)	0.038 (0.025)	0.037 (0.025)	0.037 (0.025)	0.038 (0.025)
<i>Turnover</i>	-0.096*** (0.018)	-0.096*** (0.018)	-0.097*** (0.018)	-0.095*** (0.018)	-0.097*** (0.018)
<i>Committee</i>	0.758*** (0.216)	0.763*** (0.216)	0.777*** (0.215)	0.774*** (0.216)	0.768*** (0.217)
<i>Intercept</i>	4.038*** (0.306)	3.969*** (0.303)	4.025*** (0.307)	4.002*** (0.305)	3.920*** (0.303)
<i>Mean VIF</i>	2.38	2.64	3.20	2.73	2.40
<i>Breusch-Pagan/Cook-Weisberg test</i>	195.00***	232.35***	190.10***	201.06***	241.81***
<i>Wald chi2</i>	284.84***	281.59***	280.04***	275.81***	286.74***
<i>Arellano-Bond test</i>	-11.911***	-11.897***	-11.895***	-11.880***	-11.687***

Note: Standard errors are shown in parentheses.

*, **, *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

Source: Prepared by the authors.

In all models, we find a positive and significant association between all firm performance measures and CEO cash compensation. This positive coefficient is consistent with previous research (Aguiar & Pimentel, 2017; Amzaleg et al., 2014; Brandão et al., 2019) and supports the view that CEO compensation schemes should be associated with firm performance to align CEO interests in higher levels of compensation with shareholder interests in higher wealth. Regarding CEO narcissism, we find no consistent evidence that more narcissistic CEOs tend to receive higher levels of compensation, considering that *Narc* is only significant in column 2. This finding contradicts previous evidence that CEO narcissism is positively associated with CEO compensation (Ham et al., 2018; O'Reilly et al., 2014).

Although the overall results suggest that firm performance and CEO narcissism could lead to higher levels of CEO compensation, the negative and significant interaction coefficients in columns 2, 3, 4, and 5 indicate that the positive association between the firm performance measures and CEO compensation is weakened by CEO narcissism. This finding supports the view that the psychological characteristics of top executives are determinants of strategic choices, as stated in the Upper

Echelons Theory (Hambrick & Mason, 1984), and confirms our hypothesis that CEO narcissism negatively moderates pay-performance sensitivity, indicating that more narcissistic CEOs tend to reduce the alignment of their compensation with firm performance.

Considering these results together, CEO narcissism emerges as a “dark side” in the design of executive compensation plans. The evidence suggests that narcissistic CEOs use their beliefs about their superior qualities in terms of competence, intelligence, and leadership abilities (D'Souza et al., 2018; Gruda et al., 2021) to convince the board of directors to compensate them with proportionally larger fixed compensation than variable compensation. This raises concern for investors, boards, and recruiters, given that there are plausible reasons to presume that the majority of CEOs of public companies have narcissistic tendencies (D'Souza & Lima, 2021).

In order to test the robustness of our findings, we rerun the analyses using CEO total compensation as our dependent variable. Table 5 presents our estimations using annual stock returns, return on assets, return on equity, return on sales, and EBITDA as proxies for firm performance (columns 1 to 5, respectively).

Table 5
CEO total compensation, firm performance, and narcissism score

	Dependent variable: CEOTotComp				
	1	2	3	4	5
RET	1.611** (0.665)				
ROA		0.448 (0369)			
ROE			0.081 (0.067)		
ROS				0.177 (0.231)	
EBITDA					0.245 (0.338)
Narc	0.101 (0.106)	0.350 (0.151)	0.089 (0.103)	0.161 (0.113)	0.151 (0.112)
RET x Narc	-5.165* (2.881)				
ROA x Narc		-3.308** (1.336)			
ROE x Narc			-0.406 (0.290)		
ROS x Narc				-1.968** (0.843)	
EBITDA x Narc					-2.444** (1.222)
Size	-0.126*** (0.036)	-0.128*** (0.036)	-0.127*** (0.036)	-0.124*** (0.036)	-0.116*** (0.036)
Debt	0.078 (0.116)	0.036 (0.117)	0.052 (0.115)	0.029 (0.116)	0.062 (0.119)
Growth	0.277*** (0.047)	0.305*** (0.051)	0.277*** (0.047)	0.312*** (0.049)	0.301*** (0.052)
Ownership	-1.495 (1.071)	-1.579 (1.064)	-1.504 (1.065)	-1.540 (1.059)	-1.549 (1.070)
Duality	0.090*** (0.032)	0.092** (0.032)	0.090*** (0.032)	0.089*** (0.032)	0.092*** (0.032)
Turnover	-0.039 (0.027)	-0.039 (0.027)	-0.040 (0.027)	-0.038 (0.027)	-0.043 (0.027)
Committee	1.301*** (0.485)	1.294*** (0.493)	1.321*** (0.483)	1.313*** (0.489)	1.305*** (0.490)
Intercept	4.243*** (0.361)	4.223*** (0.368)	4.252*** (0.363)	4.225*** (0.363)	4.133*** (0.363)
Mean VIF	2.38	2.64	3.20	2.73	2.40
Breusch-Pagan/Cook-Weisberg test	138.22***	152.91***	130.67***	134.02***	148.32***
Wald chi2	800.60***	802.29***	798.49***	807.31***	781.12***
Arellano-Bond test	-13.873***	-13.871***	-13.854***	-13.869***	-13.650***

Note: Standard errors are shown in parentheses.

*, **, *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

Source: Prepared by the authors.

The results in Table 5 show that the positive association between annual stock returns and CEO compensation remains consistent when we use CEO total compensation as our dependent variable. However, similar to CEO narcissism (*Narc*), the accounting-based performance measures have lost their statistical significance. This inconsistent association between CEO compensation and firm performance measures supports the call for research on moderating factors that could improve our understanding of the pay-performance relationship (Aguinis et al., 2018).

The results in Table 5 also show that the interaction between stock returns and CEO narcissism ($RET \times Narc$) is negatively and significantly associated with CEO total compensation ($CEOTotComp$), highlighting that the moderating effect of CEO narcissism on the pay-performance relationship depends on compensation

schemes. This finding is consistent with the notion that each compensation element (e.g., bonuses, stock awards, and stock options) may have a unique influence on executive behavior, as they have different time and risk characteristics (Devers et al., 2007).

Thus, although there are differences between the firm performance measures because market-based measures are noisy and more difficult to influence directly by CEO actions than accounting-based performance measures (Sloan, 1993), and considering that market-based measures reflect investors' perceptions of future value, whereas accounting-based measures reflect current (and recent past) performance (Devers et al., 2007), overall, our results show that more narcissistic CEOs avoid aligning their total compensation with both market-based (*RET*) and accounting-based measures (*ROA*, *ROS*, and *EBITDA*).

5. SUPPLEMENTAL ANALYSIS AND ROBUSTNESS CHECKS

5.1 Does Overconfidence Bias Have a Distinct Moderating Effect on Pay-Performance Sensitivity?

Although narcissism and overconfidence are theoretically distinct — considering that overconfidence relates only to the perception of reality, whereas narcissism is a complete personality trait that describes both cognition and behavior (Aktas et al., 2016) — we follow previous research (Aktas et al., 2016; Malmendier & Tate, 2008; Olsen et al., 2014) and conduct a supplemental analysis to empirically distinguish the effect of CEO overconfidence and CEO narcissism on pay-performance sensitivity.

An important distinction between narcissism and overconfidence is the narcissist's exhibitionistic need for constant attention and admiration. Narcissists have an inflated sense of self that they work hard to maintain and enhance. They have a need to feel important and recognized by others. Overconfidence, on the other hand, is when a person places an inflated subjective probability on the occurrence of a particular outcome. Because narcissists are likely to have inflated estimates of their abilities, they are likely to have heightened overconfidence (Olsen et al., 2014).

Considering that an overconfident CEO will be particularly motivated by high incentive compensation because an overconfident CEO will overestimate the value of such incentives and the likelihood that thresholds associated with these incentives will be met (Aabo et al., 2020; Gervais et al., 2011), we could expect CEO overconfidence to be positively associated with pay-performance sensitivity. Thus, following Aktas et al. (2016) and Malmendier and Tate (2008), we use CEO speech transcripts to calculate CEO overconfidence by counting the number of occurrences of the confident keywords "optimistic," "optimism," "confidence," and "confident" and the non-confident keywords "reliable," "cautious," "conservative," "practical," "frugal," and "steady."

We then sum the number of confident and non-confident utterances over the same period used for the narcissism indicator, and create an overconfidence variable by dividing the number of confident utterances by the total number of confident and non-confident utterances for each CEO, following Aktas et al. (2016) and Malmendier and Tate (2008). Finally, we rerun our baseline regressions by substituting CEO overconfidence for CEO narcissism, including the interaction terms with the firm performance proxies, as shown in Table 6.

Table 6
CEO cash compensation, firm performance, and overconfidence bias

	Dependent variable: CEOCashComp				
	1	2	3	4	5
<i>RET</i>	0.443** (0.178)				
<i>ROA</i>		0.231* (0.233)			
<i>ROE</i>			0.018 (0.017)		
<i>ROS</i>				-0.006 (0.084)	
<i>EBITDA</i>					0.201 (0.130)
<i>Overconf</i>	-0.009 (0.011)	0.002 (0.017)	-0.006 (0.011)	-0.009 (0.011)	-0.003 (0.012)
<i>RET x Overconf</i>	-0.031 (0.339)				
<i>ROA x Overconf</i>		-1.142 (0.149)			
<i>ROE x Overconf</i>			-0.037 (0.029)		
<i>ROS x Overconf</i>				-1.021 (0.087)	
<i>EBITDA x Overconf</i>					-0.096 (0.138)
<i>Size</i>	0.027 (0.027)	0.027 (0.026)	0.026 (0.027)	0.027 (0.026)	0.032 (0.027)
<i>Debt</i>	0.047 (0.072)	0.053 (0.073)	0.026 (0.072)	0.031 (0.072)	0.047 (0.074)
<i>Growth</i>	0.187*** (0.033)	0.164*** (0.034)	0.180*** (0.033)	0.182*** (0.033)	0.163*** (0.034)
<i>Ownership</i>	-0.999 (0.801)	-1.023 (0.794)	-1.024 (0.796)	-1.021 (0.796)	-1.033 (0.796)
<i>Duality</i>	0.037 (0.025)	0.038 (0.025)	0.038 (0.025)	0.038 (0.025)	0.039 (0.025)
<i>Turnover</i>	-0.096*** (0.018)	-0.096*** (0.018)	-0.096*** (0.018)	-0.095*** (0.018)	-0.097*** (0.018)
<i>Committee</i>	0.762*** (0.212)	0.784*** (0.212)	0.783*** (0.213)	0.784*** (0.214)	0.787*** (0.214)
<i>Intercept</i>	4.061*** (0.308)	4.014*** (0.303)	4.052*** (0.307)	4.034*** (0.306)	3.941*** (0.304)
<i>Mean VIF</i>	1.18	1.51	1.22	1.24	1.20
<i>Breusch-Pagan/Cook-Weisberg test</i>	200.56***	238.87***	197.31***	206.30***	248.43***
<i>Wald chi2</i>	295.19***	289.96***	289.43***	285.26***	294.56***
<i>Arellano-Bond test</i>	-11.893***	-11.865***	-11.850***	-11.853***	-11.657***

Note: Standard errors are shown in parentheses.

*, **, *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

Source: Prepared by the authors.

Overall, the results show that CEO overconfidence is not associated with CEO cash compensation in all models. In addition, the interaction terms are also not statistically

significant, suggesting that CEO narcissism and CEO overconfidence, which sharing common characteristics, have distinct effects on CEO compensation schemes.

Table 7
CEO total compensation, firm performance, and overconfidence bias

	Dependent variable: CEOTotComp				
	1	2	3	4	5
RET	0.284 (0.255)				
ROA		-0.322 (0.214)			
ROE			-0.005 (0.023)		
ROS				-0.278 (0.127)	
EBITDA					-0.342 (0.198)
Overconf	-0.004 (0.016)	-0.003 (0.023)	0.001 (0.015)	-0.001 (0.016)	-0.005 (0.017)
RET x Overconf	0.387 (0.519)				
ROA x Overconf		0.022 (0.214)			
ROE x Overconf			-0.013 (0.036)		
ROS x Overconf				0.006 (0.124)	
EBITDA x Overconf					0.067 (0.188)
Size	-0.127*** (0.036)	-0.127*** (0.036)	-0.127*** (0.036)	-0.124*** (0.036)	-0.114*** (0.036)
Debt	0.078 (0.115)	0.029 (0.117)	0.056 (0.116)	0.026 (0.116)	0.059 (0.119)
Growth	0.279*** (0.047)	0.301*** (0.051)	0.274*** (0.047)	0.307*** (0.049)	0.298*** (0.051)
Ownership	-1.471 (1.067)	-1.522 (1.063)	-1.493 (1.064)	-1.525 (1.064)	-1.494 (1.069)
Duality	0.089*** (0.032)	0.091*** (0.032)	0.091*** (0.032)	0.091*** (0.032)	0.092*** (0.032)
Turnover	-0.039 (0.027)	-0.039 (0.027)	-0.039 (0.027)	-0.039 (0.027)	-0.043 (0.027)
Committee	1.312*** (0.480)	1.337*** (0.481)	1.331*** (0.479)	1.335*** (0.483)	1.337*** (0.482)
Intercept	4.277*** (0.363)	4.302*** (0.370)	4.271*** (0.364)	4.268*** (0.363)	4.161*** (0.36)
Mean VIF	1.18	1.51	1.22	1.24	1.28
Breusch-Pagan/Cook-Weisberg test	140.22***	154.84***	133.24***	135.57***	151.25***
Wald chi2	810.61***	808.71***	812.56***	813.79***	791.62***
Arellano-Bond test	-13.860***	-13.831***	-13.839***	-13.835***	-13.619***

Note: Standard errors are shown in parentheses.

*, **, *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

Source: Prepared by the authors.

Table 7 extends our previous results by showing that CEO overconfidence also does not influence CEO total compensation, including the interaction terms of CEO overconfidence with the firm performance proxies. Thus, after disentangling the effects of CEO narcissism and CEO overconfidence on compensation schemes, we conclude that CEO narcissism has an important effect on the pay-performance relationship relative to CEO overconfidence.

5.2 Using Delta as a Proxy for Pay-Performance Sensitivity

For robustness, we also rerun our models by using *Delta* as our proxy for pay-performance sensitivity. *Delta* is defined as the change in the dollar value of the executive's wealth for a one percentage point change in the stock price (Coles et al., 2006) and is an alternative measure of pay-performance sensitivity commonly used in prior studies that examine the relationship between CEO compensation and firm performance (e.g. Coles et al., 2006; Ozkan, 2011). Table 8 presents the results of this robustness check.

Table 8
CEO narcissism and delta

	Dependent variable: Delta		
	1	2	3
<i>Narc</i>	-11.711** (5.427)		-11.683** (5.431)
<i>Over</i>		-0.407 (0.956)	-0.366 (0.957)
<i>Size</i>	5.058*** (1.647)	5.012*** (1.623)	5.069*** (1.646)
<i>Debt</i>	1.024 (1.142)	1.204 (1.173)	1.029 (1.140)
<i>Growth</i>	0.558 (1.626)	0.647 (1.620)	0.551 (1.622)
<i>Ownership</i>	307.803*** (111.853)	307.646*** (111.950)	307.692*** (111.872)
<i>Duality</i>	-5.560*** (2.019)	-5.659*** (2.065)	-5.556*** (2.019)
<i>Turnover</i>	0.925 (0.841)	0.888 (0.845)	0.920 (0.843)
<i>Committee</i>	1.135 (1.812)	1.065 (1.773)	1.099 (1.805)
<i>Intercept</i>	-37.524*** (12.200)	-40.715*** (13.403)	-37.632*** (12.186)
<i>Industry dummies</i>	Yes	Yes	Yes
<i>Year dummies</i>	Yes	Yes	Yes
<i>F statistic</i>	3.11***	3.09***	3.10***
<i>Adjusted R-squared</i>	0.066	0.065	0.066
<i>Shapiro-Wilk test</i>	22.078***	22.082***	22.078***
<i>Mean VIF</i>	4.11	4.11	4.10
<i>Breusch-Pagan/Cook-Weisberg test</i>	438,593.04***	434,513.83***	438,462.29***

Note: Standard errors are shown in parentheses.

*, **, *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively.

Source: Prepared by the authors.

The results in Table 8 show that CEO narcissism has a negative and significant coefficient in all models.

These findings are consistent with our previous evidence, supporting the view that more narcissistic CEOs tend to

reduce the alignment of their compensation with firm performance. In addition, these results reinforce our previous findings that CEO overconfidence is not a driver

of pay-performance sensitivity, given that *Overconf* is not statistically significant.

6. CONCLUDING REMARKS

This study examined whether CEO narcissism has a moderating effect on pay-performance sensitivity. Using a sample of 1,057 non-financial U.S. firms from 2002 to 2018, our main results show that CEO narcissism negatively moderates the association between CEO compensation and firm performance. Therefore, our results suggest that CEO narcissism can be viewed as a “dark side” in the design of executive compensation plans, as it reduces pay-performance sensitivity and does not reflect recommended corporate governance practices.

Further robustness checks also highlight that our findings are robust to alternative measures of pay-performance sensitivity and that our results are not driven by CEO overconfidence. This suggests that CEO narcissism and CEO overconfidence, while sharing common characteristics, have distinct effects on CEO compensation schemes. Hence, after disentangling the effects of CEO narcissism and CEO overconfidence on compensation schemes, we conclude that CEO narcissism has an important effect on the pay-performance relationship relative to CEO overconfidence.

By providing empirical evidence that narcissism weakens the relationship between executive compensation and firm performance, our findings support the view that the psychological characteristics of top executives are determinants of strategic choices, as posited in the Upper Echelons Theory. Furthermore, our findings have implications for the updated version of the Upper Echelons Theory (Hambrick, 2007), which calls for research on the combined effects of executives’ personality traits and compensation systems.

This study makes the following contributions to the existing literature. First, to the best of our knowledge, we provide the first empirical evidence of the moderating effect of CEO narcissism on pay-performance sensitivity. This contribution extends the prior literature on CEO narcissism and executive compensation, which does not explore whether CEO narcissism might misalign CEO interests in higher levels of compensation with shareholder interests in better firm performance.

Second, we shed light on the “dark side” effect of CEO narcissism in reducing the intensity of the pay-performance relationship. Although existing studies have examined whether this dark personality trait is associated with decision-making under conditions of uncertainty and risk,

perceptions of dishonesty, tax avoidance, power-seeking, and earnings manipulation, it is not clear whether narcissism is associated with pay-performance sensitivity. Thus, this study provides additional empirical evidence of the “dark side” of narcissism in the design of executive compensation.

Third, we also contribute to the existing literature that calls for research to examine the role of psychological and observable characteristics of CEOs in the design of compensation mechanisms. Therefore, we extend the discussion on the low positive pay-performance sensitivity (or its non-significance) documented in prior literature, suggesting that this might be partially attributed to CEOs’ dark personality traits, which play a role in the design of executive compensation.

As a practical implication, this study contributes to shareholders and potential investors by showing that they might expect higher agency costs when investing in firms led by narcissistic CEOs, considering that narcissistic CEOs tend to receive higher levels of compensation than their peers, regardless of company performance. This behavior tends to reduce shareholder wealth because narcissistic CEOs continue to receive higher levels of compensation even during “bad times” (e.g. abnormally negative return periods).

These novel findings could also be useful for board members and recruiters, as they could consider this psychological aspect when proposing compensation schemes to CEOs. In this regard, we believe that the psychological assessment of CEOs is important not only when defining compensation mechanisms, but also when hiring them, since narcissism might lead to these mechanisms not producing the expected effect. Hence, it is important for boards and recruiters to fine-tune compensation contracts to align with CEO personality traits, such as narcissism.

Finally, our results could have implications for employees. A strong pay-performance relationship could indicate a performance-driven culture. Thus, if CEOs weaken this link, it could impact the overall culture of the organization, as employees might perceive that their efforts are not appropriately recognized and rewarded. As a result, the organization might face challenges in retaining top talent and attracting new skilled individuals.

This study has some limitations. First, our results are limited to a unique setting in which national cultural

factors, such as individualism, could influence the presence of more narcissists. Second, although we mitigate endogeneity concerns through GMM-SYS estimations, we cannot make causal inferences. Finally, we rely only on the use of first-person pronouns to capture CEO narcissism, which, although validated and widely used in previous research, also has limitations.

Therefore, further studies could examine this relationship in a cross-country study in order to explore different settings of national culture, and also employ alternative measures

of CEO narcissism, such as the size of the CEO's picture in the annual report, which may confirm our current results. Furthermore, although narcissism is one of the components of the so-called dark triad, this personality trait could also encompass "bright side" behaviors. Hence, it may be worthwhile for future studies to examine whether narcissism might act in a positive light, leading to increases in firms' financial performance, mergers and acquisitions (M&A), voluntary disclosure, and environmental, social, and corporate governance (ESG) ratings.

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FUNDING

This study was partially funded by the Coordination for the Improvement of Higher Education Personnel (Capes) – Finance Code 001.