



## When Structure Meets Personality: How Duality and Social Dominance Affect the Short Vs Long Term Focus of the CEO

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This study incorporates executive personality research into the study of CEO duality. Specifically, we propose that the effect of CEO duality on strategic decision making will depend on the CEO's level of social dominance. As CEO social dominance increases, CEO duality is associated with higher long-term perspective than CEO-Chair separation. Our research supports this theory by developing a unique measure of CEO social dominance through the use of pre-trained machine learning models. The results of our study indicate general support for our model in terms of long-term compensation, and R&D intensity. Thus, this study highlights the need to consider CEO personality when studying the effect of CEO duality on strategic decision making.

Keywords: CEO Duality; Executive Personality; Executive Compensation; R&D Intensity

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# **When Structure Meets Personality: How Duality and Social Dominance Affect the Short Vs Long Term Focus of the CEO**

## **INTRODUCTION**

The impact of CEO duality on firm performance is one of the most studied topics in the corporate governance literature (e.g., Krause, Semadeni, and Canella, 2014). Studies have examined the effect of duality - the practice of a single individual serving as both CEO and chair of the board - on numerous firm outcomes including strategic change, strategic risk, performance, acquisition premium, and CSR (e.g., Benischke et al., 2019; Boyd, 1995; Recendes et al., 2022; Wang et al., 2022). These studies have considerably advanced our understanding of the impact of duality, but have largely overlooked the role of CEO personality traits in determining how duality affects CEO decision making. This is surprising because it is widely assumed that CEO duality affects firm outcomes through its impact on CEO decision-making (e.g., Dowell et al., 2011). For example, CEO duality influenced their CEO risk taking (Benischke et al., 2019). Our study addresses this important oversight. Specifically, we argue that, of the various personality traits that could impact the effects of CEO duality, a CEO's level of social dominance may be particularly important. Social dominance has been defined as the motivation to attain influence, deference, and prominence, leading to a propensity for aggressive, forceful, or coercive behavior that results in increased social rank (Anderson & Kilduff, 2009; Cheng et al., 2013; Henrich & Gil-White, 2001). Drawing on prior findings that a perceived threat to the social standing of a person tends to activate social dominance behaviors (Maner, & Case, 2016), we argue that CEO duality affects CEO decision making by reducing such perceived threats among those high on social dominance.

We examine the contingent role played by social dominance in firms with and without CEO duality. Informed by prior research associating personality traits with financing choices, investment choices, and operating performance (Gow et al., 2016), our theory explains how and why CEO social dominance may enable CEOs to adopt a long-term perspective. Our arguments are rooted in the social psychology literature on personality traits that showed how individuals high in social dominance tend

to go to great lengths to protect their power when in leadership positions (Maner, 2017). As such, these individuals are highly sensitive to threats to their power and view other talented group members as potential rivals (Case & Maner, 2014; de Waal-Andrews et al., 2015). Extensive research shows that when individuals experience psychological threat, they adopt a short-term perspective regardless of possible long-term consequences (Gray, 1999). We further argue that while CEO-Chair separation activates threat perception that leads to a short-term perspective, CEO duality reduces these perceptions of threat, allowing social dominant CEOs to adopt a long-term orientation.

To test our hypotheses, we created and validated a novel measure of social dominance that is based on personality profiles of 397 CEOs in 241 US publicly held biopharmaceutical firms over the period 1995-2018. We follow a multi-step process to establish this novel measure of social dominance based on previously validated measures in experimental research (e.g., Witkower et al., 2020) and we further used both machine learning and manual collection and validation to code our novel measure of social dominance. Further, while many operationalizations of CEO long-term perspective may exist, we focus on long-term CEO compensation and R&D intensity as our measures R&D intensity is critical to achieving sustainable competitive advantage in biotechnology firms and the compensation of executives in these firms is often in tune to the longer time required to bring a product to commercialization stage. We find broad support for our hypotheses and discuss our contribution to the corporate governance and executive personality literatures.

## **THEORY AND HYPOTHESES**

One of the main responsibilities of the board of directors is to monitor the CEO of the firm. Although monitoring can take many forms, such as CEO selection and dismissal (Walsh & Seward, 1990), many studies have focused on structural arrangements, such as avoiding having the same person serve as the CEO and the chairperson of the board, i.e., CEO duality (Rechner & Daiton, 1991). Research suggests that having separate individuals for these roles is beneficial for the company's success as it allows for more effective board monitoring (Harris & Helfat, 1998), avoid having the CEO control meeting agendas and locations (Tuggle et al., 2010), and allow outside

directors' independent advice on strategic decisions (Dalton et al., 1998). On the other hand, some scholars argue that CEO duality has advantages. For example, research shows that this structure can lead to quicker responses to crises (Dowell et al., 2011) and improved firm performance in dynamic and complex environments (Boyd, 1995), as the CEO has the authority to make critical decisions. While the evidence for the impact on CEO duality on various firm outcomes is decidedly mixed (see Krause et al., 2013 for a review), some studies suggest that personality characteristics might be correlated with the effectiveness of CEOs (Kaplan et al., 2012) and that even predict the financing and investment choices that they make (Gow, et al., 2016).

### ***Social Dominance versus Other Personality Traits***

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Indeed, executive personality research has demonstrated that several personality traits have a significant impact on the behavior of top managers, including narcissism, extraversion, charisma, core self-evaluations, and hubris (Malhotra et al., 2018; Simsek et al., 2010; Wowak et al., 2016; Gutierrez et al., 2020). Important in our context where we study CEO duality, evidence from social psychology suggests that of the many traits that may be prominent among executives, social dominance is particularly important (e.g., Judge et al., 2002).

While social dominance presents conceptual similarities with other personality traits enumerated, it is also distinct from these. Studies have revealed that social dominance has a positive correlation with narcissism (Case & Maner, 2017). While narcissistic individuals crave authority for attention, social dominant individuals seek it for power and influence (Maner & Mead, 2010). Further, narcissists are known to be self-absorbed and self-admiring, while social dominants are not. Second, both extraversion and social dominance lead to assertiveness and visibility, however, extraverted individuals are not always controlling or aggressive like social dominants (DesJardins et al., 2015). Third, both social dominance and charisma are related to exuding confidence (Wowak, et al., 2016; Kakkar et al., 2020). However, charisma involves inspiring others by appealing to their emotions and

motivations, while social dominance involves ruling through fear and obedience, not actual persuasion (Chen et al., 2012; Wowak et al., 2016). Forth, core self-evaluations lead to transformational leadership (Resick et al., 2009), while social dominance is associated with abusive leadership (Khan et al., 2018). Lastly, while social dominant individuals display hubristic pride in their accomplishments (Cheng et al., 2010), they do so to signal their competence and attain a higher position (Kakkar et al., 2020). Table 1 outlines these differences.

### ***Social Dominance and CEO Duality***

Previous research has investigated the impact of CEO duality on various firm outcomes (e.g., Cannella & Lubatkin, 1993; Schepker, & Barker III, 2018) and assumed that CEO duality affects the behavior of the CEO while paying little concomitant attention the personality characteristics of the CEOs studied. In contrast, we propose that social dominance is an individual attribute of particular importance because it may reduce the perceived threat that may activate social dominance behaviors, enabling social dominant CEOs to adopt a more long-term perspective and resulting in higher levels of long-term CEO compensation and increased R&D intensity. Social dominance is characterized by a strong drive to influence and control others, leading individuals high in this trait to constantly seek power (Cheng et al., 2013; Kakkar et al., 2020). Once they attain a position of power, individuals high in social dominance become hypersensitive to perceived threats to their power, and often interpret many situations as threatening (Maner, 2017). Conversely, when they feel that their power is secure, they do not experience a sense of threat (Maner, & Case, 2016). Research suggests that social dominant individuals behave differently depending on whether they feel their power is safe or threatened. For example, when they feel threatened, they may withhold information from others and demote and control talented group members (Mead & Maner, 2012; Tost, Gino, & Larrick, 2013). These behaviors are absent when social dominant individuals feel that their power is secured (Maner, 2017). Given these findings, social dominant individuals may be particularly sensitive to different board structural roles that provide them with varying levels of power security, such as CEO duality.

This may lead to different sets of perception and behavior patterns among social dominants in these roles.

The theoretical mechanism that we propose to underlie the relationship between social dominance, CEO duality, and decision making is the cognitive and emotional responses to threat (Finkelstein & Hambrick, 1996). When a CEO is socially dominant, they may have a heightened sense of self-importance and a strong desire for control and influence (Anderson et al., 2012). This can make them more sensitive to perceived threats to their power and influence within the company (Finkelstein & Hambrick, 1996). When the chairman of the board is not the CEO, they may perceive this person as a threat to their power, because they may not have full control over the decision-making process (Haleblian & Finkelstein, 1999). This perceived threat can lead to cognitive and emotional responses that favor a short-term perspective (Malmendier & Tate, 2005). For example, the CEO may feel the need to make quick decisions and take immediate action to demonstrate their value to the company and protect their position. They may prioritize short-term gains, such as meeting quarterly targets, over long-term initiatives that may take longer to yield results. This can result in a focus on short-term goals at the expense of long-term ones (McShane & Von Glinow, 2010). In contrast, when a CEO also holds the position of chairman, they may feel less threatened and more secure in their position of power. They may have greater control over the decision-making process, and may feel more confident in their ability to influence the company's direction over the long term. This can lead to a greater focus on long-term initiatives such as investing in R&D, rather than just meeting short-term targets. Accordingly, we hypothesize that:

***Main Hypothesis:** Social dominance moderates the relationship between CEO Duality and long-term perspective, such that as social dominance increases, CEO duality is associated with higher long-term perspective than CEO-Chair separation.*

## **DATA AND METHODS**

To better understand the effect of CEO duality on firm outcomes, we examine the contingent role played by social dominance in the context of firms with and without CEO duality. We test our predictions on a sample of 397 CEOs in 241 publicly held pharmaceutical and biotechnology companies, identified by the three-digit SIC code 283, over the period 1995 to 2018. A firm enters our dataset if data exists for at least three consecutive years.

***Dependent variables.*** Our focus is on whether CEO social dominance and CEO duality jointly affect the long-term perspective of the CEO in biotechnology firms. To operationalize long-term perspective, we settle on *long-term compensation* and *R&D intensity* as our two dependent variables of interest. Long-term compensation has been found to encourage executives to pursue long-term objectives of the firm (Flammer & Bansal, 2017), while R&D intensity may lead to returns in the distant future (Gentry & Shen, 2013). We manually code data on CEO compensation from DEF-14 and 10-K filings, which we verify using Standard & Poor's Execucomp. *Long-term CEO compensation* includes restricted shares, restricted stock options, and LTIP payouts. We control for short-term CEO compensation (base salary and annual bonuses). *R&D intensity* is calculated as the ratio of R&D expenditure to the firm's total annual sales. We consider two types of R&D expenditures. The first includes only in-house R&D which we collect from the Compustat database. The second is the sum of in-house, alliance, and acquisition R&D, which we manually collect from 10K reports using the procedure detailed by Lungeanu, Stern, and Zajac (2016).

***Independent variables.*** Our first independent variable of interest is *CEO Duality*, where 1 denotes that the CEO also holds the chairperson position and 0 otherwise. Our second independent variable is *CEO social dominance*, which is defined as one's motivation to attain prominence, deference, and influence, leading to coercive, forceful, and aggressive behavior. We follow prior research that has validated that physical elements in documentary sources are a good way to capture CEO personality characteristics (Petrenko et al., 2019). Our choice of non-verbal measurement of social dominance provides several advantages, including the ability to assess ongoing psychological traits without the use of intrusive questions that may yield low response rate, and socially desirable

responding that may bias the data, typical of self-report methods (Cycyota & Harrison, 2006; Witkower et al., 2020). Drawing on Chatterjee and Hambrick's (2007) assertion that CEOs are attentive to the content and design of annual reports, and carefully determine being portrayed in desired manner, we analyze photographs of CEOs in annual reports and shareholders letters. We follow a multistep process of establishing and validating a measure of social dominance that relies on a wide range of experimental studies.

*Step 1.* Collecting social dominance measures in experimental research (i.e., expansive body pose, smile absence, head angle and eye gaze). *Step 2.* Collecting CEO photos from annual reports and shareholders letters. *Step 3.* Coding visual facial expressions. We use a machine learning approach to code the visual measurements of social dominance collected in step 1 (expansive body pose, smile absence, head angle and eye gaze) and manually validated them with a team of research assistants. Each photo receives a value for all different measures. The supervised machine learning underlying algorithm uses convolutional neural networks (Yu & Zhang, 2015) to code facial expressions. At a very high level, the image recognition process involves taking a static frame of a CEO's face as an input and transforming the image into a field of weighted pixels to code facial expressions (smile, head tilt, eye gaze). *Step 4.* Coding body expansive poses. A team of 10 research assistants collected data on body expansion (stance width, arms angle, arms extension from body, torso, and chest) and scored the photo from 1-5. Any photo that had at least one value above 2 was treated as high level of body expansion. *Step 5.* Constructing the CEO Social Dominance measure. Past research has found mixed results regarding how each one of these measurements corresponds to levels of social dominance, we based our final measure on a set of at least two of the different measures that gave a score of 0- low social dominance, or 1 -high social dominance. We averaged the score for each CEO for all years in our sample and use a single score for each CEO.

***Control variables.*** Due to space limitations, we do not discuss our choice of industry, firm, group, and individual level controls. They are however available in Table 3.

## **Analytical Approach and Results**



We use a panel data and the treatment variable (CEO duality) is endogenous. Thus, we perform an instrumental variable panel regression (XTIVREG regression in Stata 16.1), with robust standard errors and a Baltagi's EC2SLS random-effects estimator (Baltagi, 1981; Baltagi & Liu, 2009). The instrumental variable panel regression appropriately accounts for the endogenous character of the CEO duality. More specifically, to remove bias resulting from modeling endogenous variables with a single equation (e.g., standard ordinary least squares [OLS] models), we employ a two-stage procedure using instrumental variables (Greene, 2003; Morrow et al, 2007). To be effective (i.e., not weak), the instrumental variables should not be related to long-term compensation and R&D intensity predicted in the second stage, but should be related to the endogenous variable predicted in the first stage (Kennedy, 2008). We identified the SEC *regulatory activity* as our instrumental variable. The general argument we put forth is that a greater regulatory activity signifies greater institutional attention to firm governance practices, which affects firms' choices of CEO duality. To capture regulatory activity, we use the releases concerning SEC rulemaking, a process that starts when either Congress or SEC sees the need to address ambiguities in established legislation or to shift its interpretation. The process starts with publishing a proposed rule on the SEC website, typically followed by a 30-day period in which the SEC takes public comments. A final rule is then published or a new rule is proposed. Alternatively, the SEC can immediately adopt a rule without notice or the minimum 30-day comment period. However, as in the case of proposed rules, the SEC can solicit comments from the public after the rule becomes effective, and may similarly change or replace rule. We thus focus on proposed and interim rules to operationalize the variable *regulatory activity* as the sum of proposed and interim rules published in the previous year. This instrumental variable was included in the first-stage models, but was not included in the second-stage predicting long-term compensation and R&D intensity models. Furthermore, we identified both CEO duality and the interaction CEO social dominance x CEO duality via instrumental variable *regulatory activity*.

In order to select the best model class, we ran three tests: (1) The Wooldridge test for autocorrelation in panel data (Wooldridge 2002) indicated the presence of serial correlation and, as

such, we used robust standard errors (e.g., for compensation model,  $F(1, 292) = 16.434, p = 0.0001$ ). (2) The Hausman test (Green, 2008) indicated that the random effects model is preferred as it is more efficient than fixed effects model (e.g., for compensation model,  $\chi^2(14) = 15.16, p = 0.3674$ ). Finally, (3) the Breusch and Pagan Lagrange Multiplier test for random effects (i.e., pooling vs random effects) indicated that random effects is appropriate (e.g., for compensation model,  $\text{chibar}2(01) = 703.49, p = 0.000$ ).

## RESULTS

The results of the first-stage models (Table 2) indicate that our instrumental variable, *regulatory activity*, is meaningful in explaining firm's decision to "employ" a dual CEO (Model 1,  $\beta = -0.001, p < 0.01$ ). Additionally, *regulatory activity x CEO dominance* is meaningful in explaining firm's decision to "employ" CEO social dominance x CEO duality (Model 3,  $\beta = -0.001, p < 0.05$ ). The results of second-stage models (Table 3) indicate broad support for our hypotheses. The margins Table 4, unreported t-tests for significant differences, and reported graphical illustrations together suggest that CEO duality positively affects long term compensation only when CEO dominance is high. However, when controlling for short-term compensation, CEO duality has an effect on long-term compensation for both low and high CEO dominance. Further CEO duality has effect on R&D intensity (both in-house and total R&D) only when CEO dominance is low.

## DISCUSSION

Our study offers important theoretical and empirical contributions for the corporate governance and executive personality literatures. First, we provide a major departure from previous corporate governance research with our emphasis on the contingent role of CEO personality for CEO duality. While prior studies have considerably advanced our understanding of the impact of duality on various firm outcomes, they have largely overlooked the role of CEO personality traits in determining how duality affects CEO decision making. This is surprising because it is widely assumed that CEO duality affects firm outcomes through its impact on CEO decision-making (e.g.,

Recendes et al., 2022). Our paper takes a step towards addressing this gap. In particular, the theoretical mechanism that we propose underlie the relationship between social dominance, CEO duality, and firm outcomes is the cognitive and emotional responses to threat.

Second, while the evidence for the impact of CEO duality on various firm outcomes is mixed (see Krause et al., 2013 for a review), some studies suggest that personality characteristics might be correlated with the effectiveness of CEOs (Kaplan et al., 2012) and the financing and investment choices that CEOs make (Gow et al., 2016). Our results highlight the importance of considering CEO personality characteristics jointly with structural determinants of power when predicting firm outcomes. Future research could further investigate the role of other personality traits, such as narcissism, charisma, or hubris in shaping CEO decision-making and firm performance. Finally, our study contributes to the broader literature on the antecedents and consequences of CEO social dominance, and underscores the need for more nuanced and context-dependent conceptualizations of this construct. Our study further demonstrates the empirical value of using machine learning to assess CEO personality, specifically through the use of facial recognition methods. In sum, this research opens up opportunities and describes a method for strategy researchers, and in particular, executive personality scholars, to explore the vast repositories of image data available across various settings.

## TABLES AND FIGURES

**Table 1** Social Dominance: Definitions, Similarities and Differences with Cognate Constructs

Construct	Definition	Similarities	Differences
Core-self evaluation	“a broad personality trait” that includes low neuroticism and high internal locus of control (LOC), generalized self-efficacy, and self-esteem	Both social dominance and core self-evaluations involve positive perception of the self	Core self-evaluations have been found to elicit transformational leadership behaviors (Resick et al., 2009). Social dominance has been linked to abusive forms of

	(Simsek et al., 2010, p. 111).	(Simsek et al., 2010, p. 111).	leadership based on coercion and intimidation (Khan et al., 2018).
Hubris	“Exaggerated pride or self-confidence, often resulting in retribution” (Hambrick & Hayward, 1997, p. 106).	Social dominant individuals tend to exhibit confidence and hubristic pride at the presence of one’s achievement (Cheng et al., 2010).	Hubris may be displayed spontaneously. Social dominants displaying hubris and exaggerated confidence do so to signal competence and as means to attain an elevated position (Kakkar et al., 2020).
Charisma	“A characteristic of individuals who ‘by force of their personal abilities are capable of having profound and extraordinary effects on followers” (Wowak, et al., 2016, p.593).	Both Social dominance and charisma are related to exuding confidence (Wowak, et al., 2016; Kakkar et al., 2020).	Charisma involves inspiring followers to perform above and beyond the call of duty by appealing to their emotions and enduring motives. Social dominance, involves ruling subordinates by fear, and is thus a matter of compliance rather than actual persuasion (Chen et al., 2012; Wowak et al., 2016, p.593).
Over-confidence	“A tendency to probabilistically overestimate one’s knowledge and abilities” (Patel & Cooper, 2014, p.1529)	Social dominance and overconfidence are associated with ascending social hierarchies due to their positive impact on	Social dominance and overconfidence are related yet distinct ways in which individuals ascend social hierarchies (Li et al., 2016).

		perceived competence (Li et al., 2016).	
Narcissism	“The degree to which an individual has an inflated sense of self and is preoccupied with having that self-view continually reinforced” (Chatterjee, & Hambrick, 2011, p. 204).	Social dominance shares conceptual similarities with three facets of narcissism as both are related to arrogance, entitlement, exploitiveness, and authority seeking (Cheng et al., 2010, 2013; Emmons, 1987; Maner & Mead, 2010).	Narcissistic individuals seek authority in order to gain attention, social dominant ones desire it as a source of power and influence. Further, while self-absorption/self-admiration are present among narcissistic individuals, these tendencies have not been documented in the social dominance literature. Narcissistic individuals are constantly preoccupied with how extraordinary and special they are. Social dominant individuals are preoccupied with how to maintain higher social rank (Emmons, 1987; Maner & Mead, 2010).

**Table 2.** First-stage models predicting CEO Duality and the interaction CEO duality x CEO dominance

	Model 1	Model 2	Model 3
	CEO duality	CEO duality	CEO duality x CEO dominance
Regulatory activity	-0.001** (0.008)	-0.001* (0.048)	0.000 (0.929)
CEO dominance	-0.080** (0.006)	-0.052 (0.563)	0.472*** (0.000)
Regulatory activity x CEO dominance		-0.000 (0.738)	-0.001* (0.022)
Firm age	0.003*** (0.000)	0.003*** (0.000)	0.002*** (0.000)
Firm size (sale ln)	0.009 (0.106)	0.009 (0.107)	0.002 (0.415)
Board size	-0.009+ (0.093)	-0.009+ (0.092)	-0.004 (0.148)
Board independence (%)	-0.010 (0.875)	-0.010 (0.877)	-0.022 (0.506)
CEO board recruitment (%)	0.163*** (0.000)	0.163*** (0.000)	0.124*** (0.000)
CEO tenure company	0.012*** (0.000)	0.012*** (0.000)	0.004*** (0.000)
CEO internal hire	-0.003	-0.003	-0.009

	(0.886)	(0.892)	(0.448)
CEO age	0.008***	0.008***	0.004***
	(0.000)	(0.000)	(0.000)
CEO ethnicity (white)	0.039	0.039	0.012
	(0.334)	(0.342)	(0.585)
CEO short-term compensation (ln)	0.026+	0.026+	0.031***
	(0.081)	(0.081)	(0.000)
Year	-0.009*	-0.009*	-0.005*
	(0.016)	(0.016)	(0.011)
Year square	-0.001+	-0.001+	-0.001**
	(0.071)	(0.072)	(0.002)
Constant	-0.223+	-0.236+	-0.481***
	(0.071)	(0.073)	(0.000)
Observations	2106	2106	2106
R-squared	0.176	0.176	0.348
F-statistics	57.378	53.657	60.487

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p-values in parentheses; robust standard errors; + p<0.10, \* p<0.05, \*\* p<0.01,

\*\*\* p<0.001

**Table 3.** Second-stage models predicting CEO compensation and R&D intensity

	CEO long-term compensation		R&D Intensity (In-house)		R&D Intensity (Total)	
	Model		Model		Model	
	Model 1	Model 2	3	Model 4	5	Model 6
CEO duality	0.870 (0.319)	-3.676+ (0.051)	0.026 (0.729)	-0.289* (0.018)	0.023 (0.810)	-0.453** (0.005)
CEO dominance		-2.367* (0.048)		-0.212** (0.002)		0.315*** (0.001)
CEO duality x CEO dominance		6.295* (0.024)		0.472** (0.009)		0.728** (0.003)
<i>[Controls; same controls as in the first-stage models]</i>						
Observations	2106	2106	2101	2101	2101	2101
R2 (between)	0.286	0.188	0.284	0.178	0.232	0.114
Wald-chi2	273.811	211.839	186.483	169.003	144.920	80.256

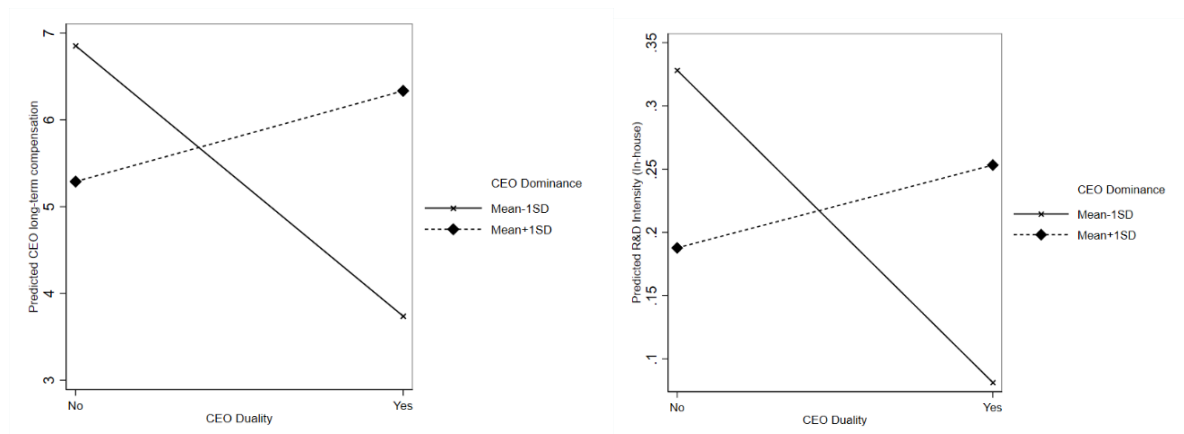
p-values in parentheses; + p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001



**Table 4.** Margin effects

Dependent Variables	CEO dominance: Level	CEO dominance: Value	Marginal effect	z-Statistics	p-value
Long-term compensation	Low	0.09	-3.12	-1.90	0.058
	High	0.75	1.05	2.62	0.009
R&D Intensity (In-house)	Low	0.09	-0.25	-2.32	0.020
	High	0.75	0.07	2.69	0.007
R&D Intensity (Total)	Low	0.09	-0.39	-2.74	0.006
	High	0.75	0.09	2.33	0.020

**Figures 1 & 2:** Interaction effects of CEO Duality x CEO dominance on CEO long-term compensation and R&D intensity



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