Journal of Organization Design (2021) 10:19–34
https://doi.org/10.1186/s41469-021-00091-6

RESEARCH

Organizational structure and CEO dominance

Christian Schumacher[1]

Received: 10 April 2020 / Accepted: 4 January 2021 / Published online: 9 February 2021

Abstract
We explore the effects of chief executive officers' (CEOs') personal dominance—an idiosyncratic character trait strongly associated with a desire for influence and control—on two fundamental organizational design decisions: the CEO's span of control (1) and her delegation of responsibilities as reflected in the appointment of a chief operating officer (COO) (2). Linking three original measures of CEO dominance based on quarterly earnings calls with manually collected data on span of control and COO positions for a sample of CEOs presiding over large US corporations, we demonstrate that CEOs who are high in dominance have a significantly larger personal span of control and delegate fewer decision rights than less-dominant CEOs. We discuss implications of our findings and future questions from an organizational design perspective.

Keywords Organizational design · Chief executive officers · Personality traits · Dominance · Span of control

Introduction

An organization's design—often not fully transparent to outsiders and thus eluding easy inimitability (Barney 1991)—can be an important source of sustainable competitive advantage (Aghion et al. 2014; Bloom and Van Reenen 2010; Bloom et al. 2012; Csaszar 2012). In order to be effective, organizational design must, among other things, mitigate incentive differences between agents and the overall organization so that collective goals can be attained. This problem has long been recognized, and addressing it would appear challenging enough in instances when principals can design relationships with their agents so as to maximize corporate profits (Aghion and Tirole 1997; Bolton and Dewatripont 2013; Jensen and Meckling 1976; Nyberg et al. 2010). However, what if the agent to whom most of the design is delegated, the firm's chief executive officer (CEO), optimizes the organizational structure subject to her personal idiosyncratic preferences?

Prior research has established that a CEO's personality manifests itself in a variety of important strategic decisions (Finkelstein et al. 2009; Hambrick and Mason 1984; Hambrick 2007) and that CEOs' impact on organizational outcomes has strongly increased over the last decades (Quigley and Hambrick 2015). However, as of this writing we do not know whether and how organizational design decisions are affected by CEOs' idiosyncratic personality traits. Motivated by this lack of research and the need to better define the psychological underpinnings of strategy research (Flynn et al. 2012; Powell et al. 2011), we address this gap in our paper. In particular, we focus on the effect of one important yet hitherto underinvestigated personality trait on CEOs' design decisions: dominance (Buss and Craik 1980; Cheng et al. 2013; Gough 1987; Wiggins 1979).

Individuals possessing a dominant personality have a strong desire for influence and control (e.g., Anderson and Kilduff 2009). Thus, dominance seems particularly prone to affect decisions on organizational structure. We propose that dominance—a latent personality trait that solidifies when individuals reach positions of ultimate authority (Cheng et al. 2010, 2013)—affects two key structural variables: span of control and the delegation of decision rights. In particular, we suggest that dominant CEOs will have a larger span of control than their nondominant peers and that dominant CEOs are less likely to delegate decision rights to chief organizational officers (COOs). Our results, obtained on a sample of 186 CEOs presiding over firms listed in the S&P 500, corroborate both of our hypotheses.

Our study bears relevance for both researchers and practitioners in strategy research and organizational design more

✉ Christian Schumacher
christian.schumacher@wu.ac.at

[1] Department of Global Trade and Business, Vienna University of Economics and Business, Welthandelsplatz 1, 1020 Wien, Austria

broadly. By providing evidence on a hitherto unexplored behavioral antecedent to inter-firm variation in organizational structure, we complement recent scholarship by fellow strategists (e.g., Csaszar 2012; Lin and Germain 2003). Organizational scholars more broadly may also view our findings as contributing to upper-echelon theory and the growing literature on CEO personality (see, e.g., Finkelstein et al. 2009; Hambrick and Mason 1984; Hambrick 2007). Previous research in this area has explored the effects of CEO personality traits such as narcissism (e.g., Chatterjee and Hambrick 2007, 2011), overconfidence (Malmendier and Tate 2005, 2008), and temporal focus (Nadkarni and Chen 2014) on investment decisions. We add to this stream of literature by showing that a hitherto understudied CEO personality trait—dominance—affects even one of the most fundamental aspects of organizations: their formal structure. Moreover, we believe that future scholars in this area may benefit from our original development and validation of unobtrusive measures of CEO dominance in this paper. Finally, to management executives, our work offers a viable test of assessing whether current CEOs may exhibit dominant behavior.

How CEOs (should) design organizations

Specialization, coordination, and optimal span of control

The effectiveness of organizations—systems in which different actors with private information and individual incentives coordinate to achieve common goals (March and Simon 1993)—increases as managers better balance the notoriously difficult trade-off between realizing specialization gains through division of labor, on one hand, and minimizing the costs of integrating effort, on the other (Lawrence and Lorsch 1967; March and Simon 1993). Dividing labor encompasses partitioning of tasks and their allocation to members of the organization, whereas integration of effort speaks to the resolution of both cooperation and coordination problems (Puranam et al. 2014). Parsing tasks so that employees frequently repeat them engenders task-specific learning and creates specialization advantages (Smith 1776). Moreover, matching individuals to tasks that they are better skilled to perform than others increases independently organizational effectiveness (Lazear 2004). Fostering cooperation between agents requires satisfying their individual utility functions, which may include pecuniary (Simon 1951) and nonmonetary components (Dahlander and O'Mahony 2011; Ostrom 1990). As regards coordination, most organizations resort to the use of authority or layers thereof—also known as hierarchies—to ensure that decision rights are optimally allocated within the collective, and that information diffuses from where it originates to where it is needed (Szulanski 1996; for an overview see Aghion et al. 2014).

Hierarchies can be characterized by their depth (number of layers of authority) as well as their breadth (number of agents working at the same layer), also known as the layer's span of control. Previous work has theorized extensively about what determines an organization's optimal span of control. Williamson (1967) proposes that the degree to which the goals of workers and managers in the organization are misaligned should be positively associated with a hierarchy's depth and correlate negatively with optimal span. Similarly, Rajan and Zingales (2001) suggest that in physical-capital-intensive industries the span of control should be lower than in human-capital-intensive industries because the problems of misaligned incentives should be stronger in the latter. Aghion and Tirole (1997) posit that the optimal span of control is negatively linked to both managers' monitoring costs and the extent to which subordinates reduce their effort as a consequence of direct monitoring. And finally, extant empirical studies attest to the relevance of two further determinants of hierarchical depth and breadth that had not featured as prominently in the modeling literature: firm size (e.g., Colombo and Delmastro 1999; Pugh et al. 1968) and diversification (Guadalupe et al. 2013; Rajan and Wulf 2006).

In keeping with prior theorizing and taking stock of stylized facts, one recent contribution by Lee (2014) formally summarizes extant conjectures about the determinants of an optimal span of control, while additionally suggesting that a manager's skill for coordinating her subordinates will also affect the span of control she optimally chooses. Starting from the uncritical assumption that coordinating in itself is a skill acquired through repetition and learning, it stands to reason that the coordinative skills of a manager will be higher than those of her subordinates. Lee (2014) hence argues that the number of subordinates that optimally report directly to a manager (a.k.a. segment-specific span) should be proportional to (1) the number of coordination tasks that need to be conducted by the manager and her subordinates (N) and (2) the expected difference in the value contribution between the segment manager and his or her subordinates (p_1–p_2) in helping coordinate the firm's actions, and inversely proportional to (3) the marginal cost of communication the manager incurs when instructing and monitoring her subordinates (σ_1).

$$k_1^* = \sqrt{\Delta p_1} \cdot \frac{N}{\sigma_1} \text{ if } \Delta p_1 \equiv p_1 - p_2 > 0 \quad (1)$$

Equation (1) not only formally summarizes prior conjectures on the optimality of an organization's span of control, however. It also serves as an orientation as to how

suboptimal breadth in a hierarchy may originate from managers' personal predispositions and behaviors. Notably, Eq. (1) highlights that executives' idiosyncratic reasons for having fewer or more subordinates report to them directly than seems efficient may result from the managers' (exaggerated) perceptions of their own coordination skills as well as the subjectively lower communication and monitoring costs they incur. Such perceptions may well be driven by the most-senior managers' personality traits.

CEO personality

CEOs inject much of their personality into their decisions and leadership behavior (Carpenter et al. 2004; Peterson et al. 2003; see Finkelstein et al. 2009, for a summary). Prior studies have established strong links between CEOs' strategic decisions and their personal character traits such as narcissism (Chatterjee and Hambrick 2007, 2011; Gerstner et al. 2013), overconfidence (Malmendier and Tate 2005, 2008), and the degree to which they allocate their attention between the past, present, and future—their so-called temporal focus (Nadkarni and Chen, 2014). Moreover, empirical evidence suggests that these personal idiosyncrasies of CEOs have a mostly negative effect on organizational performance (e.g., Bertrand and Schoar 2003; Malmendier and Tate 2005, 2008; for an overview see Bollaert and Petit 2010). Within this class of potentially harmful and often obscure personality traits, the greatest challenge to organizations is posed by those traits that may affect decisions over which CEOs possess a large degree of personal discretion, as related CEO actions are difficult for corporate stakeholders to counterbalance should it become necessary. CEOs' choices pertaining to the design of the organization rank among the most obvious examples of such actions, as they are generally considered the most-senior management's unique domain of responsibility. This is because structuring the firm to achieve optimal performance is precisely one of the major tasks for which a CEO is hired, and as such her decisions pertaining to such (re-)organizations usually go uncontested (e.g., Ma et al. 2015).

Asking which type of personality trait might exert the greatest effect on design decisions within corporations is structurally equivalent to asking which trait leads senior leaders to enjoy exaggerated control and influence over others. Research in social psychology suggests that one personality trait stands out from all the others in that regard: dominance (see Anderson and Kilduff 2009, for an overview).[1] Dominance is defined as the "tendency to behave in assertive, forceful, and self-assured ways; it is the desire for control and influence" (Cheng et al. 2013, p. 106). Prior research has demonstrated that individuals with dominant personalities exhibit a desire to control and influence their environment (Murray 1938) and display this behavior in a variety of settings (Buss and Craik 1980; Emmons and McAdams 1991; Gough 1987; Wiggins 1979). It is a clearly established empirical finding that individuals who are more dominant seek and attain high levels of influence in organizations (e.g., Maner and Mead 2010). This strongly suggests that trait dominance will be prevalent in CEOs (e.g., Anderson and Kilduff 2009). That being said, this research also suggests that not every leader in an organization is high in trait dominance, and that leaders in positions of power differ substantially from one another in their will to control and influence subordinates (Anderson and Kilduff 2009; Cheng et al. 2010; Henrich and Gil-White 2001; Maner and Mead 2010, 2012; Van Vugt 2006). More recently, scholars in social psychology have focused on examining how dominant personalities attain power in organizations and identify dominance as a fundamental strategy of leaders to gain and maintain power (Anderson and Kilduff 2009; Cheng et al. 2010, 2013; Johnson et al. 2012; Maner 2016). CEOs high in trait dominance want to keep their power over others once they reach the pinnacle of the hierarchy (Cheng et al. 2013; Henrich and Gil-White 2001; Maner and Mead 2010, 2012). Therefore, this line of research emphasizes that dominance influences the strategic means individuals use to attain and maintain control (e.g., Cheng et al. 2013). The fact that dominant CEOs are highly motivated to establish and maintain their power over others (Maner and Mead 2012) influences their preferences for strategic actions and, thus, suggests important implications for organizational design decisions. Interestingly, while scholars have empirically studied dominance in leaders in adjacent disciplines such as in the political sciences (Ferguson and Barth 2002; Hermann 1980; Winter 2003, 2005), there is as of today no research in management connecting dominance with organizational outcomes.

[1] Dominance is central concept in understanding the behavior of humans and other species and, therefore, has been studied extensively, for over 75 years, from many different perspectives. For example, ethologists study dominance by observing whether animals gain scarce resources over other animals (Alcock, 1989); socio-biologists examine testosterone levels of nonhuman primates and show that dominance in chimpanzees, for example, leads to higher rank within the hierarchy and greater reproductive success (Eibl-Eibesfeldt, 1989; Ellis, 1995); sociologists use the term to describe dominant relationships from certain social groups over others (Dreher and Gassebner, 2008; Patil, 2002); and evolutionary psychologists see dominance as a fundamental behavioral strategy to obtain high rank in human hierarchies (e.g., Maner and Mead, 2010; Mead and Maner, 2012; Van Vugt, 2006; Van Vugt, Hogan, and Kaiser, 2008). Despite the variety of terminology used in different streams of literature, there is a broad consensus among scholars on the existence of a particular behavioral system that triggers dominant behavior with the goal of having control and influence over material sources (Johnson et al., 2012).

The effect of CEO dominance on organizational design

As described, the primary "function" of dominant personalities is to establish and maintain control and influence in settings with other people (Gough et al. 1951; Horowitz et al. 2006; Wiggins 1979). We thus argue that dominant CEOs will act strategically in their organizational design decisions to establish as much control as possible and protect their powerful position in the face of threats to their ability to control others. Bridging the aforementioned literatures and extending prior arguments on the effects of dominance on control and influence, we suggest that dominant CEOs will adjust two key organizational structure variables (Colombo and Delmastro 2008): span of control (1) and the appointment of a COO (2).

Specifically, in line with prior work (Rajan and Wulf 2006; Wulf 2012), which argued that increased CEO involvement and control is strongly associated with a larger span of control, it would appear that one way for CEOs to satisfy their desire for control and influence is to unduly increase the span of control beyond what would be considered an otherwise optimal level. Importantly, having a wider span of control satisfies the dominant CEOs desire to control and influence more subordinates. By having more subordinates dominant CEOs are more involved with their executive team and have a larger number of coordination tasks to fulfill. This is also in line with research showing that CEOs with a wider span of control spend a larger share of their time interacting with their management team (e.g., Bandiera et al. 2014). At the same time, a wider span of control makes it easier for the CEO to control and monitor the direct reports and thus protect their powerful position, as compared to a lower span that might give rise to few powerful executives. Based on this reasoning we posit the following:

Hypothesis 1: Dominant CEOs will, all else being equal, have a wider span of control than less-dominant CEOs.

Importantly, modifying the breadth of the second management layer may not be the only way for a CEO to assuage her need for control. In particular, a dominant CEO should be less willing to delegate decision-making authority in ways that would reduce her opportunities to engage in direct instructions and monitoring. As a consequence, CEOs should be less willing to appoint a COO to the top management team, as the COO position explicitly takes away responsibilities for many business decisions from the CEO and decentralizes decision-making (Hambrick and Cannella 2004; Marcel 2009; Zhang 2006). For example, Hambrick and Canella (2004) analyze the determinants of a COO and argue that the presence of the position significantly changes the nature of the CEO's job, since it allows them to delegate internal operating matters and focus more intensively on external and strategic activities. As Hambrick and Cannella (2004) posit: "the decision to have a COO represents a major structural choice: it explicitly divides between two people a set of top level roles that are typically fulfilled by one person; it draws a structural distinction between strategy formulation and implementation". (p. 198). Importantly, research also posits that the responsibilities which are overtaken by the COO mainly include the coordination of employees (Hambrick and Cannella 2004; Marcel 2009). This line of reasoning is also consistent with research from Bandiera et al. (2014) which shows that the position of a COO negatively affects the time CEOs spent in interactions and meetings with their subordinates which decreases the opportunity to control them. We therefore propose the following:

Hypothesis 2: Dominant CEOs will, all else being equal, be less likely to have a COO on their top management team than less-dominant CEOs.

Naturally, both the span of control and the appointment of COOs may be also affected by other determinants, including dominance-unrelated characteristics of the CEO. Disentangling these effects from dominance-related effects does not affect the validity of our theoretical arguments, but represents an empirical challenge, which we address below.

Data

Empirical setting and data collection

Our sample to assess the relationship between organizational structure and CEO dominance consists of CEOs who presided over the 250 largest (by market capitalization) companies in the S&P 500 index in 2014.

We collected data on each CEO's span of control and the existence of a COO position for 2014 from a private consulting company called Alta Data.[2] In 17 cases, data on either span of control or COOs were not available, reducing our sample to 233 observations. We then merged these data with information on firm financials and CEO characteristics which we obtained from Compustat and Execucomp, respectively. To control for succession effects (Chatterjee and Hambrick 2007, 2011; Gerstner et al. 2013; Petrenko et al. 2015), we dropped 12 observations in which the CEO in the year 2014 had only been in office for one year. Moreover,

[2] Note that the choice of the year 2014 is largely constrained by the availability of span of control and COO appointment data that are not accessible for prior years.

we removed 13 observations in which data on CEO characteristics from Execucomp was not available, leaving us with 208 data points. We then collected all available earnings calls in which the 208 CEOs had participated between 2010 and 2013 from Thomson One. In 22 cases, no earnings calls were available. Removing those observations left us with our final sample of 186 cross-sectional observations for which complete information exists about (1) the CEO's span of control in 2014, (2) the presence of a COO in 2014 (or lack thereof), (3) the CEO's trait dominance, and (4) firm and industry characteristics for the year 2013.

One concern with our described sample may be that our sample shows selective features that hamper inference beyond the 186 cases we examined in detail. In an attempt to rule out that our sample differed from the otherwise widely established S&P 1500 population, we ran simple *t*-test comparisons (our sample vs. the entirety of the S&P 1500) for those variables deployed in our study which could easily be computed for all CEOs of the largest 1500 firms in the United States. Results indicate that that there is no significant difference between the ages of CEOs in our sample and the rest of the S&P 1500 population ($t = 0.115$; $p = 0.909$); furthermore, there is also no significant difference in the ratio of female to male CEOs between the two samples ($t = -0.023$; $p = 0.982$). There, however, is a significant difference in CEO-tenure between the two groups, with CEOs in our sample having a shorter tenure ($t = 3.505$; $p = 0.001$) and receiving on average higher compensation than the CEOs of the rest of the S&P 1500 ($t = -18.72$; $p = 0.000$). Moreover, a joint logit specification on whether a firm enters our sample (1: yes; 0: otherwise) based on a set of these variables suggests that of the four variables, CEO-compensation ($p = 0.000$) and tenure ($p = 0.003$) significantly predict whether a firm enters our sample.

Dependent variables

Obtaining large-scale cross-sectional data on the organizational structure of firms is a notoriously difficult endeavor, which in the past often led to a focus on small-scale, in-depth studies (Baker et al. 1994). More recently, authors have begun to deploy survey data collected from consulting companies that capture detailed information on job descriptions, titles, and reporting relationships within firms (Guadalupe and Wulf 2010; Rajan and Wulf 2006). In this paper, we follow this latter approach and rely on manually collected data from a private company, Alta Data, that specializes in gathering and verifying detailed information on reporting relationships within firms. Thus, our data have an advantage in that we do not have to rely solely on job titles to identify our dependent variables, but instead have information on actual reporting relationships between executives when measuring our dependent variables. Moreover, all reporting relationships were manually verified by Alta Data employees, and our data are thus considerably more reliable than information from other sources such as organigrams or job titles. Drawing on Alta Data's reporting-relationship data for 2014, we construct two dependent variables. First, we measure the span of control as the number of persons directly reporting to the CEO. Second, we code whether a *COO* was present (1; 0 otherwise).

Independent variables

Measurement of dominance

Two approaches to measuring dominance in individuals have been repeatedly deployed in the past: (1) using surveys with dominance scales to be filled out by the individuals themselves (Wiggins 1979; Cheng et al. 2010), and (2) computing unobtrusive measures based on observing a person's communication style (e.g., Burgoon et al. 1998; Norton 1983). Sending questionnaires to top managers often comes at the expense of low response rates (Anseel et al. 2010). Moreover, questions about sensitive issues—such as dominant behavior—typically yield particularly not very high response rate (Cycyota and Harrison 2006), and answers of the managers are often influenced by a social desirability bias (Chatterjee and Hambrick 2007, 2011; Hirsch and Pozner 2005). As a consequence of these limitations, unobtrusive measurement approaches such as observing a CEO's communication style have become the norm in research on executive psychology (Carpenter et al. 2004; Finkelstein et al. 2009; Hill et al. 2014). Following the latter approach, we measure CEOs' trait dominance based on observing their communication style during quarterly earnings calls.

Earnings calls

Earnings calls have two parts: (1) the presentation section, in which the CEO and other executives describe company performance and strategy; and (2) the Q&A section, in which managers of the firm and analysts engage in a question-and-answer format (Kimbrough 2005). Earnings calls are an essential form of communication between top management and capital providers (Li et al. 2009), and almost all large public companies use them as an inexpensive information platform (Bushee et al. 2003). We argue that earnings calls are an excellent source of information for measuring dominance in CEOs, for several reasons. First, during earnings calls, managers' report the strategy and performance of their company in a question-and-answer format with analysts (Kimbrough 2005; Li et al. 2009), and it is therefore easy to observe how often a CEO seizes control of the conversation. Second, earnings calls are an important source of information for analysts and investors (Bushee et al. 2003, 2004;

Mayew 2008; Li et al. 2009; Mohr and Schumacher 2019), so they provide rich repositories of information exchange. Third, other than letters to shareholders, media reports, or interviews, earnings calls also avoid the (legitimate) criticism that much of the recorded information might not be attributable to the CEO herself. Fourth, earnings calls have the advantage of generally following a consistent schedule across companies: an opening statement by the CEO of the company followed by a question-and-answer session between senior executives and analysts facilitates interorganizational comparison (Li et al. 2009). We downloaded the quarterly earning call transcripts from Thomson One. Next we parsed the text and identified the date of each call and the ticker symbol and name of each firm using a C# computer program written for this purpose. We used the consistent format of earnings calls to split the earnings calls into three parts: (1) the cover, the corporate participants, and the conference call participants; (2) the presentation section; and (3) the Q&A section. We parsed the first part to examine the name and title of the earnings call participants. We then determined the exact number of words spoken and how many times a person spoke in the earning call—accordingly for each participant for each of the respective parts. In a final step, we extracted the specific language of each participant. This allowed us to perform content analysis (Pennebaker et al. 2003) on the CEO-specific language using LIWC.

To code our independent variable, we follow the approach by Norton (1983),[3] who argues that dominance can be measured by observing three typical behaviors in a persons' verbal interactions: (1) monopolization of the talk, as reflected in a person talking for long periods and not letting others talk; (2) involvement in the talk, as reflected in the person's lack of hesitation to speak up and not letting others start a conversation; (3) forcefulness, as reflected in the individual's coming across as strong and talking assertively. We derived one measure for each of these categories in the following way.

Dominance 1—monopolization Dominant personalities talk often, for long periods, and do not let others talk (Norton 1983). Several studies use the amount of speech as one dimension of their measures (Aries et al. 1983; Kimble and Musgrove 1988; Mehrabian 1969) and show that dominant persons indeed talk for more time than others (Anderson and Kilduff 2009; Judge et al. 2002). Thus, we measured this tendency of CEOs to monopolize the conversation as the number of words a CEO speaks in the presentation section in relation to total words spoken during the presentation section.

$$\mathrm{CEO}_{\mathrm{Dominance1}} = \frac{\text{Number Words CEO}}{\text{Total Words}}$$

Dominance 2—involvement Our second measure reflects the tendency of dominant individuals to neither hesitate to speak up nor to let others start conversations. Following research showing that dominant personalities express their opinions more frequently (Kalma et al. 1993; Moskowitz 1990), we measure this as the number of times a CEO seizes the conversation during the Q&A earnings call (CEO takeover) over the total number of times any participant speaks during the Q&A section.

$$\mathrm{CEO}_{\mathrm{Dominance2}} = \frac{\text{Number CEO Takeovers}}{\text{Total Takeovers}}$$

.

Dominance 3—assertiveness This measure reflects the extent to which a CEO speaks assertively or forcefully during the calls. Especially more recent research focuses on the assertive dimension of dominant behavior (Cheng et al. 2013), but also prior research shows that dominant personalities speak more assertively (Aries et al. 1983). We measure this as the inverse of the CEO's takeovers during the Q&A section and the total use of polite words in the Q&A section. We measured the use of polite words using content analysis with the LIWC software and included the words please, thank, thanks.

$$\mathrm{CEO}_{\mathrm{Dominance3}} = \frac{\text{Number CEO Takeovers}}{\text{Number polite Words CEO}}$$

We aggregate all measures to the CEO level across all earnings calls she was involved with. As such, our measure of dominance is time invariant, purposefully reflecting theoretical claims that dominant behavior should be a stable personal disposition.[4] For each of our three core independent measures, we first take the logarithm and then standardize its value. Our analysis is based on 974 transcripts of earnings calls in which the 186 CEOs in our sample took part between January 2010 and December 2013.

[3] Latter studies have repeatedly studied the three categories of Norton's approach: dominant persons indeed talk for more time than others (Anderson and Kilduff, 2009; Judge et al., 2002), more often express their opinions (Kalma, Visser, and Peeters, 1993; Moskowitz, 1990; Anderson and Kilduff, 2009), and speak in a more assertive tone (Aries, Gold, and Weigel, 1983; Anderson and Kilduff, 2009).

[4] We also keep with prior work on executive personalities (Chatterjee and Hambrick, 2007, 2011; Gerstner et al., 2013; Petrenko et al., 2015; Zhu and Chen, 2014) relying on time-invariant measures when capturing CEO personality traits.

Control variables

We deploy a series of controls at various levels of analysis.

CEO controls We controlled for CEO-age and CEO-tenure and CEO-gender. Given that CEOs with larger structural power could have greater discretion (Jensen and Meckling, 1976) we also control for structural power (Finkelstein, 1992) by (1) capturing if the CEO was also chairman of the board, CEO-COB$_{t-1}$, and (2) by teasing out variance attributable to the ratio of CEO-compensation to the total compensation of the top management team, CEO-compensation (Ridge et al. 2015).

Earnings call controls We controlled for the total number of earnings calls that were available for each CEO, Number EC, and the average number of top managers who participated in the earnings calls, Participants EC.

Firm and industry controls Prior research showed that one key determinant of organizational structure is firm size (Collins et al. 1999; Colombo and Delmastro 1999; Pugh et al. 1968). We thus add the natural logarithm of total assets of a firm's, Size, as a control variable in our regressions.[5] In addition, we also included three-digit SIC-code dummies to control for industry effects. Finally, given that recent research (Guadalupe et al. 2013) suggests that a firm's level of diversification has a positive effect on the number of executives reporting directly to the CEO, we also control for diversification using a modified Herfindahl index (Amit and Livnat 1988) in our regressions, Diversification.[6]

Lastly, we also controlled if a specific firm met the earnings forecasts, which could in turn affect if the CEO engages in impression management in the earnings calls (e.g., Hayward and Fitza 2017). Specifically, we collected earnings forecasts from the IBES database (see e.g., Bloom et al. 2004 for more details) and coded with a binary indicator if the forecasts were missed or not: Missed earnings forecast. Furthermore, as a second complimentary control we coded a variable if a firm was above or below their performance aspiration level. Specifically, following prior work (e.g., Bromiley 1991; Miller and Chen 2004; Chen and Miller 2007; Lim and McCann 2014), we employed return on assets (ROA) as our main measure of firm performance. We follow prior research and computed a firm's historical aspiration level as the firm's ROA in the previous year. We then derived each firm's performance feedback as the difference between the firm's actual performance and its respective aspiration level (e.g., Schumacher et al. 2020). This procedure resulted in two control variables: positive performance feedback and negative performance feedback.

Model and estimation

To test our hypotheses concerning the link between organizational structure and dominance, we use the following baseline specification:

$$\mathrm{OS}_{it} = \beta_0 + \beta_1 \mathrm{Dominance}_{it-1} + w'_{it-1} + u_i,$$

where i denotes the firm and t denotes time. Dominance is one of our three measures of dominance, and w'_{it-1} is a vector of all controls. We follow prior literature and use a lagged design, to account for the fact that structural changes require time to manifest themselves (Acemoglu et al. 2007; Chatterjee and Hambrick 2007; Gerstner et al. 2013; Petrenko et al. 2015). Therefore, all right-hand-side variables refer to 2013, whereas the dependent variables are for 2014. Our dependent variable is either span of control or COO appointment.

Results

Table 1 presents means, standard deviations, and correlations for all our variables. Our data for span of control and COO appointments are similar to those in other studies examining structural organizational variables. For example, Guadalupe et al. (2013) report an increasing trend in the span of control over the last decades and find a mean of 9.8 for the year 2008, which is comparable to our value of 10.7 for the year 2014. In yet a different study, Zhang (2006) reported that 28% of firms in his sample employed a COO, the same value we found for our sample. Similarly, our variables derived from earnings calls—the mean values for total words and references per earnings call—are comparable to those in recent studies using earnings calls from large American firms (Mayew 2008; Li et al. 2009; Mohr and Schumacher 2019). Correlations appear to be small to moderate between most variables, except for the word and reference counts that constitute our three dominance measures.[7]

Table 2 reports the results for Hypothesis 1, which posited that CEO dominance would be positively related to span of control. We first test each of our three dominance measures separately across three different specifications. In addition, we test for joint significance of the measures within both OLS and Poisson estimations and furthermore test our predictions, in order to eliminate time-invariant unobserved heterogeneity, through fixed-effects analysis

[5] Note that alternative firm-size measures (total revenues and total employees) led to no change in our results.

[6] We compute the measure following the standard procedure by Amit and Livnat (1988) as $1 - (\sum_j s_j^2 - \sum_j s_j)^2$ where s_j is the share of a firm´s total sales to the jth SIC industry group.

[7] We further address resulting issues below when interpreting our regression results.

Table 1 Correlation and descriptive statistics

Variables ($N = 186$)	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Span of control	10.68	3.30	1															
2. COO	0.29	0.45	− 0.18	1														
3. Dominance 1(Std)	0		0.09	− 0.15	1													
4. Dominance 2 (Std)	0		0.1	− 0.19	0.86	1												
5. Dominance 3 (Std)	0		0.03	− 0.04	0.25	0.32	1											
6. CEO-gender	0.04	0.19	0	− 0.13	0.08	0.01	− 0.02	1										
7. CEO-tenure	7.61	4.75	− 0.08	0.2	0.03	− 0.03	0.03	− 0.18	1									
8. CEO-age	56.92	46.54	− 0.13	0.03	− 0.1	− 0.07	− 0.05	− 0.01	0.34	1								
9. CEO-COB	0.49	0.50	− 0.01	− 0.18	0.07	0	− 0.15	− 0.03	− 0.01	− 0.05	1							
10. Size	10.48	11.97	0.18	0.04	− 0.21	− 0.18	0.06	0.06	− 0.01	0.02	− 0.15	1						
11. Diversification	0.62	0.23	− 0.01	0.08	0.02	0.03	− 0.01	0.03	0.09	0.06	− 0.03	0.02	1					
12. NrWordsCEO (in Ths.)	203.37	13,919.2	0.06	0.01	0.5	0.44	0.36	0.05	0.07	− 0.11	− 0.11	− 0.04	− 0.05	1				
13. NrReferencesCEO	117.12	103.37	0.05	0.05	0.35	0.48	0.47	0.03	0.04	− 0.9	− 0.2	− 0.01	− 0.08	0.8	1			
14. Total References	511.37	329.25	− 0.01	0.16	0.03	0.12	0.47	0.01	0.04	− 0.08	− 0.17	0.08	− 0.04	0.74	0.61	1		
15. Total Words (in Ths.)	539.51	28,247.75	0.01	0.12	− 0.02	0.01	0.29	− 0.01	0.02	− 0.08	− 0.21	0.15	− 0.06	0.71	0.86	0.81	1	
16. Number EC	5.18	2.54	− 0.03	0.14	0.01	0.01	0.27	0.03	0.05	− 0.1	− 0.18	0.17	− 0.06	0.79	0.66	0.93	0.86	1

*Correlations greater than |.15| are significant at the $p < .05$ level

Table 2 Span of control as a function of CEO dominance

Variables	OLS Model 1	OLS Model 2	OLS Model 3	OLS Model 4	OLS Model 5	Poisson Model 6
Dominance 1		0.751			0.132	0.010
		(0.029)			(0.845)	(0.843)
Dominance 2			0.725		0.447	0.049
			(0.028)		(0.471)	(0.272)
Dominance 3				0.952	0.764	0.071
				(0.095)	(0.161)	(0.035)
Joint significance - F(3, 165)					3.14	
					(0.029)	
Joint significance - chi2(3)						9.88
						(0.02)
Participants EC	0.071	0.399	0.248	0.189	0.419	0.041
	(0.819)	(0.197)	(0.442)	(0.548)	(0.170)	(0.040)
Number EC	0.033	− 0.017	0.022	− 0.060	− 0.090	− 0.009
	(0.842)	(0.907)	(0.887)	(0.665)	(0.487)	(0.291)
CEO-age	− 0.037	− 0.061	− 0.056	− 0.030	− 0.054	− 0.005
	(0.650)	(0.457)	(0.488)	(0.715)	(0.520)	(0.385)
CEO-gender	1.298	1.238	0.981	2.147	2.057	0.201
	(0.598)	(0.613)	(0.685)	(0.367)	(0.382)	(0.234)
CEO-COB	0.183	0.242	0.328	0.484	0.550	0.055
	(0.781)	(0.704)	(0.609)	(0.475)	(0.411)	(0.226)
CEO-tenure	0.037	0.076	0.069	0.039	0.082	0.008
	(0.672)	(0.321)	(0.385)	(0.641)	(0.289)	(0.166)
CEO-compensation	− 0.060	− 0.066	− 0.084	− 0.039	− 0.040	− 0.003
	(0.700)	(0.679)	(0.599)	(0.806)	(0.805)	(0.794)
Firm size	0.913	1.091	0.951	0.962	1.111	0.101
	(0.028)	(0.007)	(0.021)	(0.020)	(0.006)	(0.000)
Firm diversification	1.720	1.176	1.289	1.606	1.266	0.123
	(0.232)	(0.413)	(0.358)	(0.273)	(0.395)	(0.253)
Positive performance feedback	− 3.529	− 7.499	− 0.710	− 9.831	− 11.711	− 1.131
	(0.836)	(0.654)	(0.967)	(0.580)	(0.499)	(0.343)
Negative performance feedback	− 12.800	− 13.518	− 14.034	− 16.269	− 16.969	− 1.565
	(0.572)	(0.550)	(0.514)	(0.489)	(0.472)	(0.256)
Missed earnings forecast	0.083	− 0.087	0.189	0.098	− 0.150	− 0.012
	(0.912)	(0.894)	(0.792)	(0.891)	(0.817)	(0.776)
Constant	1.871	0.504	1.882	1.039	0.105	1.401
	(0.784)	(0.941)	(0.783)	(0.883)	(0.988)	(0.003)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	186	186	186	186	186	186
R-squared	0.497	0.563	0.542	0.548	0.588	–

Robust *p*val in parentheses

on auxiliary panel data. Overall, our findings support our hypothesis. We find a significantly positive effect of dominance on span of control when deploying our single measures Dominance1 ($\beta = 0.751$; $p = 0.029$; $CI_{95\%}$ [0.060, 1.421]) and Dominance2 ($\beta = 0.725$, $p = 0.028$ $CI_{95\%}$ [0.072, 1.366]) but just a weakly significant support for our Dominance3 measure ($\beta = 0.952$; $p = 0.095$; $CI_{95\%}$ [0.051, 2.039]). Importantly, when testing for joint significance of our three measures, we obtain a significantly positive effect, OLS ($p = 0.029$) and Poisson ($p = 0.020$).

Table 3 COO appointment as a function of CEO dominance

Variables	Logit Model 1	Logit Model 2	Logit Model 3	Logit Model 4	Logit Model 5
Dominance 1		− 0.564			0.132
		(0.029)			(0.845)
Dominance 2			− 0.608		0.447
			(0.015)		(0.471)
Dominance 3				− 0.411	0.764
				(0.269)	(0.161)
Joint significance - $Chi^2(3)$					8.71
					(0.038)
Participants EC	0.150	− 0.054	− 0.034	0.083	− 0.076
	(0.492)	(0.803)	(0.874)	(0.724)	(0.750)
Number EC	0.040	0.060	0.056	0.092	0.085
	(0.643)	(0.512)	(0.537)	(0.336)	(0.388)
CEO-age	− 0.019	0.000	0.002	− 0.020	− 0.001
	(0.702)	(0.996)	(0.973)	(0.692)	(0.991)
CEO-gender	0.239	0.897	0.869	0.173	0.810
	(0.866)	(0.577)	(0.586)	(0.910)	(0.626)
CEO-COB	− 0.296	− 0.344	− 0.415	− 0.463	− 0.515
	(0.506)	(0.446)	(0.367)	(0.314)	(0.276)
CEO-tenure	0.159	0.143	0.134	0.161	0.139
	(0.012)	(0.017)	(0.029)	(0.009)	(0.023)
CEO-compensation	− 0.068	− 0.032	− 0.029	− 0.076	− 0.037
	(0.589)	(0.806)	(0.822)	(0.543)	(0.780)
Firm size	− 0.146	− 0.257	− 0.230	− 0.130	− 0.232
	(0.627)	(0.424)	(0.477)	(0.677)	(0.489)
Firm diversification	0.229	0.595	0.578	0.313	0.573
	(0.839)	(0.612)	(0.641)	(0.783)	(0.635)
Positive performance feedback	− 7.235	− 9.269	− 11.232	− 4.897	− 8.967
	(0.569)	(0.469)	(0.377)	(0.690)	(0.492)
Negative performance feedback	4.355	4.183	5.111	3.117	2.732
	(0.712)	(0.731)	(0.651)	(0.781)	(0.800)
Missed earnings forecast	0.369	0.244	0.238	0.397	0.298
	(0.404)	(0.597)	(0.619)	(0.384)	(0.539)
Constant	− 0.109	0.470	0.094	− 0.432	0.150
	(0.982)	(0.924)	(0.985)	(0.928)	(0.976)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Observations	147	147	147	147	147

Robust *p* val in parentheses

The separate insignificance of the dominance measures in the joint specification is attributable to the high levels of correlations between the three measures, which disguises the differential contributions of the three measures in Models 2.5 and 2.6.[8] That said, the overall explanatory power of our models increases when including all measures for Dominance in parallel, even when adjusting for the lower degrees of freedom, suggesting that our three measures all imperfectly but distinctly differently capture parts of the dominance-related variance.

Table 3 presents the results of our test of Hypothesis 2 suggesting that dominant CEOs will be less likely to employ a COO. Again, we test each of our three dominance measures individually and jointly. As suggested by Hypothesis 2, we find a significantly negative effect on the probability

[8] Computing variance inflation factors for Dominance1 (4.73), Dominance2 (4.49), and Dominance3 (3.38) in our joint specification suggests that the contribution of the three distinct measures cannot be discerned—an issue we are not primarily concerned with in this paper, however, as we are predominantly concerned with joint significance.

Table 4 Fixed-effects estimation with TMT size and presence of COO as dependent variables

DV	TMT OLS	TMT OLS	TMT OLS	TMT OLS	COO Logit	COO Logit	COO Logit	COO Logit
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Dominance 1	0.043			0.016	− 0.271			− 0.226
	(0.030)			(0.433)	(0.000)			(0.000)
Dominance 2		0.109		0.093		− 0.237		− 0.135
		(0.000)		(0.001)		(0.000)		(0.075)
Dominance 3			0.065	0.027			− 0.191	− 0.098
			(0.003)	(0.209)			(0.004)	(0.179)
Joint *F*-test				6.12				
(*p*-values)				(0.018)				
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5284	5284	5284	5284	2587*	2587	2587	2587

Robust *p* val in parentheses

*251 groups dropped because of all positive or all negative outcomes

that a CEO has a COO on her top management team for the single measures Dominance1 ($\beta = -0.564$; $p = 0.029$; $CI_{95\%}$ [− 1.068, − 0.059]) and Dominance2 ($\beta = -0.608$; $p = 0.015$; $CI_{95\%}$ [− 1.098, − 0.117]). There was no significant effect for our Dominance3 measure ($\beta = -0.411$; $p = 0.269$; $CI_{95\%}$ [− 1.140, 0.318]). More importantly, again all three measures jointly contribute to explaining COO appointments ($p = 0.038$).

Discussion of results and exclusion of alternative explanations

In the following, we discuss several possible concerns regarding the validity of our findings and provide additional empirical evidence which we collected to address these issues.

Eliminating time-invariant unobserved heterogeneity through fixed-effects analysis on auxiliary panel data.

First, similar to other studies examining the relationship between personality traits and firm-level effects (e.g., Chatterjee and Hambrick 2007; Gerstner et al. 2013; Petrenko et al. 2015), our core tests above were carried out on cross-sectional data. Considering the time-invariant nature of personality traits, such an approach seems reasonable, particularly when dependent measures are not readily available over time as in our case. That said, such an analysis stops short of eliminating time-invariant heterogeneity at the level of the organization. To tackle the latter problem and to corroborate our cross-sectional findings, we thus compiled an auxiliary panel dataset of SP500 firms in the period of 2002–2014 that would allow us to estimate firm-level fixed effects. To that end, we downloaded additional 22,000 quarterly earning call transcripts compiled from January 2002 to December 2014 provided by Thomson One for measuring dominance. We then matched our data with the Compustat and Execucomp databases, from which we drew our dependent variables and controls. Due to missing data in both databases, this process yielded a sample constituting complete data for 5,284 firm-year observations by 456 firms and 918 CEOs with an average of 6.92 years per firm. Importantly, to compensate for the lack of precise span-of-control information pertaining to the years prior to 2014 (when predecessor CEOs were in office), we computed an auxiliary dependent variable to test Hypothesis 1; notably, we measured the size of the top management teams (TMT) that current and predecessor CEOs had assembled around them—following coding procedures laid out in earlier works (e.g., Wiersema and Bantel 1992).

To assess the viability of using TMT Size as an alternative dependent variable to test H1, we correlated our TMT Size measure for 2014 with the span-of-control variable for the same year, and we obtained encouraging results ($r = 0.69$, $p = 0.000$). Moreover, to test Hypothesis 2, we collected additional information on COO appointments for each CEO in our sample. Adhering to our earlier estimation strategy (notably the lagged design), but exploiting the additional variation over time, we finally estimated a series of different models on the above-described panel data. Table 4 summarizes the results.

Paramaterizations 4.1 through 4.4 model TMT Size as a function of different CEO dominance measures, controls, and firm fixed effects. Models 4.5 through 4.8 present counterpart estimations for the dependent variable COO appointment. As can be seen from Table 4, the panel estimations support our cross-sectional findings in

that coefficient estimates for our core independent variables—the dominance measures—point in the hypothesized directions and show statistical significance. It is the convergence of results across Tables 2, 3, and 4 that makes us confident overall that CEO dominance truly exhibits the hypothesized effects. We use our panel dataset also in the next analysis to further tackle endogeneity concerns of our analysis.

Endogeneity control One important remaining concern is that our estimates could be biased due to the sorting of dominant CEOs in companies with certain organizational structure characteristics. In particular, prior research suggests that executives with certain attributes may be specifically attracted to and hired by firms where these characteristics are considered desirable due to the firm's specific circumstances (e.g., Schneider 1987).

To address such concerns, we followed prior research (Chatterjee and Hambrick 2007, 2011), and controlled for the possible case that dominant CEOs are drawn to certain situations. To do this, we run a regression of our dominance measure on a set of contemporaneous and antecedent variables. The antecedent variables were observed in the year before the CEO entered the office and included the calendar year, the performance, size and diversification of the firm, and change in performance. The contemporaneous variables were measured one year after the CEO's entry. These variables included CEO-age, CEO was also chairman of the board, and CEO ownership. Additionally, we coded using the database BoardEx whether the CEO was internally hired or not.

Of these variables, none significantly predicted our measures of CEO Dominance1 and Dominance2 and just change in performance weakly significant predicted our CEO Dominance 3 measure. When we included the predicted dominance scores as controls in our regressions all of our main results remained significant: Dominance1 and TMT size ($\beta = 0.044$; $p = 0.030$; $CI_{95\%}$ [0.004, 0.082]) and COO ($\beta = -0.270$; $p = 0.000$; $CI_{95\%}$ [− 0.390, − 0.151]); Dominance2 and TMT size ($\beta = 0.108$; $p = 0.000$; $CI_{95\%}$ [0.058, 0.159]) and COO ($\beta = -0.237$; $p = 0.000$; $CI_{95\%}$ [− 0.370, − 0.104]); and lastly, Dominance3 and TMT size ($\beta = 0.064$; $p = 0.003$; $CI_{95\%}$ [0.022, 0.107]) and COO ($\beta = -0.190$; $p = 0.004$; $CI_{95\%}$ [− 0.321, − 0.059]).

In sum, our additional analysis suggests that endogeneity due to sorting was not a main driver of our results. Yet, we also note that other research designs might be even more effective in addressing such concerns.

Operationalization and measurement validity Third, one might challenge the validity of our original unobtrusive measures in two ways. On one hand (a), one may wonder whether the measures reflect characteristics of the individual CEO or of the firm. On the other hand (b), one may question whether our measures truly capture dominance in CEOs or some other qualities. We conducted several tests to address both concerns.

If a company had institutionalized how a CEO should behave during an earnings call, then this ingrained corporate practices might make a CEO appear (non-)dominant and bias our findings. To assess whether our measures were mostly driven by factors related to the CEOs or instead to their firms, we followed Chatterjee and Hambrick (2007) and initially calculated for every predecessor of the CEOs in our sample—for which earnings calls on Thomson One were available—Dominance measures 1 and 2. This procedure yielded 110 CEO predecessor–successor pairs. The dominance scores for the successive CEOs showed considerable inconsistency ($r = 0.09$; $p = 0.352$ for Dominance1; $r = 0.043$; $p = 0.653$ for Dominance2 and $r = 0.051$; $p = 0.552$ for Dominance3), suggesting that our dominance scores were not due to certain practices of the firm. Furthermore, we identified in our sample the CEOs which have served already as a CEO in another public company included in our sample. This yielded 3 CEOs; each one of them had very similar scores for their tenures in both companies: CEO1 (for Dominance1): 0.41 and 0.38, CEO2: 0.43 and 0.46, and CEO3: 0.51 and 0.56. This small number picture shows a high degree of consistency for each CEO across successive CEO positions. This pattern together with pattern described before makes us feel confident that our measures do—per our intentions—reflect aspects of the individual CEO personalities as opposed to characteristics of their firms. Further, to explore whether our dominance measures captures dominance or if the performance of the company affects how the CEOs behaves during the earning call we calculated for every CEO in our sample for which earnings calls on Thomson One were available—Dominance measures 1, 2 and 3 for every quarterly earning call in our panel dataset. We then calculated the variance of our dominance measures within a CEO across earning calls. This procedure yielded data on 918 CEOs in our sample. The dominance scores for the CEOs showed considerable consistency ($r = 0.39$; $p = 0.00$ for Dominance1; $r = 0.33$; $p = 0.000$ for Dominance2 and $r = 0.36$; $p = 0.000$ for Dominance3) suggesting that our dominance scores were not due to the performance of the firm.

To test the construct validity of our dominance measure, we asked two research assistants to independently rate the degree of dominance for a subset of the CEOs in our sample. The research assistants were instructed in detail about the characteristics of earnings calls, the definition of dominance, and how it influences a person's communication style. Importantly, the research assistants did not receive any information about our three measures. The

assistants were then asked to read through the earnings calls and to rate the degree of dominance of each CEO on a 7-point scale ranging from 1 (not dominant at all) to 7 (highly dominant). To keep the task manageable we asked them to rate 50 randomly chosen CEOs from our sample. The correlation between the two raters of $r = 0.326$ ($p = 0.021$) indicates a significant (albeit moderate) level of agreement between them. Furthermore, the correlation between the standardized average over two raters and Dominance1 was $r = 0.53$ ($p = 0.0001$) and $r = 0.475$ ($p = 0.0005$) for Dominance2. This strongly indicates that the perceptions of our trained assistants correspond to our measures of dominance and provides corroborative evidence that our measures indeed capture the extent to which CEOs exhibit a dominant personality.

Construct relevance and distinctiveness Fourth and finally, considering the predominant focus on CEO narcissism in earlier works, scholars may wonder whether what we know from those previous studies renders our investigations obsolete. In particular, this might be the case if narcissism and dominance systematically co-occurred and if CEO narcissism exhibited effects on organizational structure similar to those exerted by dominance. To rule out this alternative, we collected additional data. Notably, drawing on the prominence of CEO photographs in annual reports, and following earlier research using this measure of narcissism (see, e.g., Chatterjee and Hambrick 2007, 2011; Gerstner et al. 2013; Petrenko et al. 2015), we coded the degree of narcissism among the CEOs in our sample, and we eventually reran our tests substituting our dominance measures for narcissism variables. As already indicated by the low (and insignificant) correlation we obtain between dominance and narcissism ($r = 0.04$ with $p = 0.562$), the alternative econometric tests relating span of control or COO appointment to narcissism yielded no significant results, in turn stressing the uniqueness and originality of our proposed relationship between organizational structure and dominance.

Discussion and further research

In this paper, we set out to establish a link between CEOs' idiosyncratic personality traits and two fundamental organizational design decisions: the breadth of a CEO's personal span of control and the existence of a COO position. In particular, we hypothesized that CEOs who are high in trait dominance will have a larger span of control and will be less likely than their less-dominant peers to appoint a COO to their top management team. To test our hypotheses, we computed three novel measures of CEO trait dominance based on quarterly earnings calls with analysts and related them to the span of control and COO appointments. Despite all residual imperfections that characterize our study, just as with most other empirical investigations, we believe that our results obtained on a sample of 186 CEOs of large US companies strongly support these hypotheses. As such, our study makes several important contributions for different communities of colleagues.

Scholars investigating organizational design as a source of sustainable competitive advantage (Aghion et al. 2014; Bloom and Van Reenen 2007, 2010; Bloom et al. 2012; Bresnahan et al. 2002; Collins et al. 1999; Colombo and Delmastro 1999, 2008; Csaszar 2012; Lin and Germain 2003; March and Simon 1993; Vázquez 2004) may see value in our investigation of a hitherto unexplored antecedent to variation in firm structure—the CEO's dominance trait. Our results are particular relevant in the light of recent research on the flattening of firms (i.e., the delayering of hierarchies). This work has shown that the purported benefits of flattening—and the resulting increase in the CEO's span of control—intended to push decision rights downwards to enhance market responsiveness (e.g., Guadalupe et al. 2013; Wulf 2012) lack manifestation: as prior work suggests, flattened firms seemingly counterintuitively have more control and decision-making power at the top than more-hierarchical organizations. Our findings are suited to reconcile this seeming contradiction. Notably, as we suggest, CEOs may simultaneously increase their span of control and retain more decision-making authority by not appointing a COO. In general our findings are also in line with recent results of laboratory experiments (Bartling et al. 2014; Fehr et al. 2013) evidencing a behavioral bias in individuals toward not delegating decision rights to others—even when it would be in their pecuniary interest. Our results indicate that a reluctance to delegate decisions might indeed be a very relevant empirical phenomenon that affects important organizational design decisions by senior leaders and is driven by the leaders' idiosyncratic personality traits.

Moreover, our findings contribute to the literature on CEO personality traits and upper-echelon theory more generally (see, e.g., Finkelstein et al. 2009). In particular, whereas prior work has established the effects of CEO personality on strategic decisions such as acquisitions (Malmendier and Tate 2005, 2008), investments in R&D (Chatterjee and Hambrick 2007, 2011), and new product development (Nadkarni and Chen 2014), we show that CEO dominance, a hitherto unexplored fundamental personality trait, affects even one of the most fundamental aspects of organizations: their formal structure.

Finally, the results of our study might also be of value to management practitioners. Boards of directors, for example, who are tasked with supervising and controlling senior management may lean on our analysis of CEOs' interactions with their subordinates or professional analysts to detect unusually high levels of CEO dominance that could

engender personally motivated decision-making within the organizations they are responsible for.

Naturally, our work leaves us with more questions than answers. Several of these questions stem from inherent limitations in our initial study on dominance and organizational structure—limitations that represent avenues for future research. In the following, we briefly discuss those that seemed most important to us. For one thing, we do not directly explore the link between CEO dominance and organizational performance. Thus we are not able to assess whether dominance in CEOs is indeed an undesirable quality, or when. In particular, it is conceivable that firms, under certain conditions, may benefit from large spans of control or the absence of a COO, or both. In such cases, boards may intentionally attempt to hire dominant CEOs who might be the most comfortable with such an organizational structure, and the implicit (albeit never testable) causality in our sample might be reversed. Addressing this question would require future researchers to craft designs that can unambiguously link corporate performance to CEO personality, an endeavor we could not embark on for lack of the needed panel data to credibly address performance questions.

Further, another important limitation of our study is the fact that we don't have data on the actual delegation of decision rights to subordinates such as the COO and it is not possible for us to check with our data whether the CEO intervenes in delegated decisions. While we argue that the COO is an appropriate proxy for the delegation of decisions rights future research should strive to measure what decisions still remain in the hands of the CEO.

Additionally, organizational design decision are not made in isolation, thus a change in one level can also have an effect on other hierarchy levels. Controlling for this would require data on the depth of the organizational hierarchy, which we do not have for our current study.

Lastly, we believe that there is a strong research potential studying dominance in CEOs more frequently. Specifically, the characteristics of having a desire for social control and the protection of their powerful positions should affect their preferences for keeping the status quo in firms and thus should also affect other organizational outcomes such as R&D investments, Acquisitions, or Divestitures.

Funding Open Access funding provided by Vienna University of Economics and Business (WU).

References

Acemoglu D, Aghion P, Lelarge C, Van Reenen J, Zilibotti F (2007) Technology, information and the decentralization of the firm. Q J Econ 5:1759–1799

Aghion P, Tirole J (1997) Formal and real authority in organizations. J Polit Econ 105(1):1–29

Aghion P, Bloom N, Van Reenen J (2014) Incomplete contracts and the internal organization of firms. J Law Econ Organ 30:37–63

Alcock J (1989) Animal behavior. Sinauer Associates, Sunderland

Amit R, Livnat J (1988) Diversification and the risk-return trade-off. Acad Manag J 31(1):154–166

Anderson C, Kilduff GJ (2009) Why do dominant personalities attain influence in face-to-face groups? The competence-signaling effects of trait dominance. J Pers Soc Psychol 96(2):491–503

Anseel F, Lievens F, Schollaert E, Choragwicka B (2010) Response rates in organizational science, 1995–2008: a meta-analytic review and guidelines for survey researchers. J Bus Psychol 25(3):335–349

Aries EJ, Gold C, Weigel RH (1983) Dispositional and situational influences on dominance behavior in small groups. J Pers Soc Psychol 44(4):779–786

Baker G, Gibbs M, Holmstrom B (1994) The internal economics of the firm: evidence from personnel data. Q J Econ 109(4):881–919

Bandiera O, Prat A, Sadun R, Wulf J (2014) Span of control and span of attention. SSRN J. https://doi.org/10.2139/ssrn.2392623

Barney J (1991) Firm resources and sustained competitive advantage. J Manag 17(1):99–120

Bartling B, Fehr E, Herz H (2014) The intrinsic value of decision rights. Econometrica 82(6):2005–2039

Bertrand M, Schoar A (2003) Managing with style: the effect of managers on firm policies. Q J Econ 118(4):1169–1208

Bloom N, Van Reenen J (2007) Measuring and explaining management practices across firms and countries. Q J Econ 122(4):1351–1408

Bloom N, Van Reenen J (2010) Why do management practices differ across firms and countries? J Econ Perspect 24(1):203–224

Bloom N, Klemm A, Newton-Smith R, Vlieghe J (2004) Technical appendix: working with IBES forecast data. https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2004/the-roles-of-expected-profitability-appendix1.pdf. Accessed 22 Jan 2021

Bloom N, Genakos C, Sadun R, Van Reenen J (2012) Management practices across firms and countries. Acad Manag Perspect 26(1):12–33

Bollaert H, Petit V (2010) Beyond the dark side of executive psychology: current research new directions. Eur Manag J 28(5):362–376

Bolton P, Dewatripont M (2013) Authority in organizations: a survey. In: Gibbons R, Roberts J (eds) The handbook of organizational economics. Princeton University Press, Princeton, Oxford, pp 342–372

Bresnahan TF, Brynjolfsson E, Hitt LM (2002) Information technology, workplace organization, and the demand for skilled labor: firm-level evidence. Q J Econ 117(1):339–376

Bromiley P (1991) Testing a causal model of corporate risk taking and performance. Acad Manag J 34(1):37–59

Bromiley P, Rau D, Zhang Y (2017) Is r & d risky? Strateg Manag J 38(4):876–891

Burgoon JK, Johnson ML, Koch PT (1998) The nature and measurement of interpersonal dominance. Commun Monogr 65(4):308–335
Bushee BJ, Matsumoto DA, Miller GS (2003) Open versus closed conference calls: the determinants and effects of broadening access to disclosure. J Account Econ 34(1):149–180
Bushee BJ, Matsumoto DA, Miller GS (2004) Managerial and investor responses to disclosure regulation: the case of reg fd and conference calls. Account Rev 79(3):617–643
Buss DM, Craik KH (1980) The frequency concept of disposition: dominance and prototypically dominant acts. J Pers 48(3):379–392
Carpenter MA, Geletkanycz MA, Sanders WG (2004) Upper echelons research revisited: antecedents, elements, and consequences of top management team composition. J Manag 30(6):749–778
Chatterjee A, Hambrick DC (2007) It's all about me: narcissistic chief executive officers and their effects on company strategy and performance. Adm Sci Q 52(3):351–386
Chatterjee A, Hambrick DC (2011) Executive personality, capability cues, and risk taking how narcissistic CEOs react to their successes and stumbles. Adm Sci Q 56(2):202–237
Chen WR, Miller KD (2007) Situational and institutional determinants of firms' R&D search intensity. Strateg Manag J 28(4):369–381
Cheng JT, Tracy JL, Henrich J (2010) Pride, personality, and the evolutionary foundations of human social status. Evol Hum Behav 31(5):334–347
Cheng JT, Tracy JL, Foulsham T, Kingstone A, Henrich J (2013) Two ways to the top: evidence that dominance and prestige are distinct yet viable avenues to social rank and influence. J Pers Soc Psychol 104(1):103–125
Collins PD, Ryan LV, Matusik SF (1999) Programmable automation and the locus of decision-making power. J Manag 25(1):29–53
Colombo MG, Delmastro M (1999) Some stylized facts on organization and its evolution. J Econ Behav Organ 40(3):255–274
Colombo MG, Delmastro M (2008) The economics of organizational design: theoretical insights and empirical evidence. Palgrave Macmillan, New York
Csaszar FA (2012) Organizational structure as a determinant of performance: evidence from mutual funds. Strateg Manag J 33(6):611–632
Cycyota CS, Harrison DA (2006) What (not) to expect when surveying executives a meta-analysis of top manager response rates and techniques over time. Organ Res Methods 9(2):133–160
Dahlander L, O'Mahony S (2011) Progressing to the center: coordinating project work. Organ Sci 22(4):961–979
Dreher A, Gassebner M (2008) Does political proximity to the US cause terror? Econ Lett 99(1):27–29
Eibl-Eibesfeldt I (1989) Human ethology. De Gruyter, New York
Ellis L (1995) Dominance and reproductive success among nonhuman animals: a cross-species comparison. Ethol Sociobiol 16(4):257–333
Emmons RA, McAdams DP (1991) Personal strivings and motive dispositions: exploring the links. Pers Soc Psychol Bull 17(6):648–654
Fehr E, Herz H, Wilkening T (2013) The lure of authority: motivation and incentive effects of power. Am Econ Rev 103(4):66–92
Ferguson MR, Barth J (2002) Governors in the legislative arena: the importance of personality in shaping success. Polit Psychol 23(4):787–808
Finkelstein S (1992) Power in top management teams: dimensions, measurement, and validation. Acad Manag J 35(3):505–538
Finkelstein S, Hambrick DC, Cannella AA (2009) Strategic leadership: theory and research on executives, top management teams, and boards. Oxford University Press, New York
Flynn FJ, Gruenfeld D, Molm LD, Polzer JT (2012) Social psychological perspectives on power in organizations. Adm Sci Q 56(4):495–500
Gerstner WC, König A, Enders A, Hambrick DC (2013) CEO narcissism, audience engagement, and organizational adoption of technological discontinuities. Adm Sci Q 58(2):257–291
Gough HG (1987) CPI manual, 2nd edn. Consulting Psychologists Press, Palo Alto
Gough HG, McClosky H, Meehl PE (1951) A personality scale for dominance. J Abnorm Soc Psychol 46(3):360–380
Guadalupe M, Wulf J (2010) The flattening firm product market competition: the effect of trade liberalization on corporate hierarchies. Am Econ J 2(4):105–127
Guadalupe M, Li H, Wulf J (2013) Who lives in the C-suite? Organizational structure and the division of labor in top management. Manage Sci 60(4):824–844
Hambrick DC (2007) Upper echelons theory: an update. Acad Manag Rev 32(2):334–343
Hambrick DC, Cannella AA Jr (2004) CEOs who have COOs: contingency analysis of an unexplored structural form. Strateg Manag J 25(10):959–979
Hambrick DC, Mason PA (1984) Upper echelons: The organization as a reflection of its top managers. Acad Manag Rev 9(2):193–206
Hayward ML, Fitza MA (2017) Pseudo-precision? Precise forecasts and impression management in managerial earnings forecasts. Acad Manag J 60(3):1094–1116
Henrich J, Gil-White FJ (2001) The evolution of prestige: freely conferred deference as a mechanism for enhancing the benefits of cultural transmission. Evol Hum Behav 22:165–196
Hermann MG (1980) Explaining foreign policy behavior using the personal characteristics of political leaders. Int Stud Q 24(1):7–46
Hill AD, White MA, Wallace JC (2014) Unobtrusive measurement of psychological constructs in organizational research. Organ Psychol Rev 4(2):148–174
Hirsch PM, Pozner JE (2005) To avoid surprises, acknowledge the dark side: illustrations from securities analysts. Strateg Organ 3(2):229–238
Horowitz LM, Wilson KR, Turan B, Zolotsev P, Constantino MJ, Henderson L (2006) How interpersonal motives clarify the meaning of interpersonal behavior: A revised circumplex model. Personal Soc Psychol Rev 10(1):67–86
Jensen MC, Meckling WH (1976) Theory of the firm: managerial behavior, agency costs and ownership structure. J Financ Econ 3(4):305–360
Johnson SL, Leedom LJ, Muhtadie L (2012) The dominance behavioral system and psychopathology: evidence from self-report, observational, and biological studies. Psychol Bull 138(4):692–743
Judge TA, Bono JE, Ilies R, Gerhardt MW (2002) Personality and leadership: a qualitative and quantitative review. J Appl Psychol 87(4):765–780
Kalma AP, Visser L, Peeters A (1993) Sociable and aggressive dominance: personality differences in leadership style? Leadership Q 4(1):45–64
Kimble CE, Musgrove JI (1988) Dominance in arguing mixed-sex dyads: Visual dominance patterns, talking time, and speech loudness. J Res Personal 22(1):1–16
Kimbrough MD (2005) The effect of conference calls on analyst and market underreaction to earnings announcements. Account Rev 80(1):189–219
Lawrence PR, Lorsch JW (1967) Differentiation and integration in complex organizations. Admin Sci. https://doi.org/10.2307/2391211
Lazear EP (2004) Balanced skills and entrepreneurship. Am Econ Rev 94(2):208–211
Lee E (2014) CEO Functional background, organizational structure and performance. Unpublished working paper

Li F, Minnis M, Nagar V, Rajan M (2009) Formal and real authority in organizations: an empirical assessment. Unpublished working paper
Lim EN, McCann BT (2014) Performance feedback and firm risk taking: the moderating effects of CEO and outside director stock options. Organ Sci 25(1):262–282
Lin X, Germain R (2003) Organizational structure, context, customer orientation and performance: lessons from Chinese state-owned enterprises. Strateg Manag J 24(11):1131–1145
Ma S, Seidl D, Guérard S (2015) The new CEO and the post-succession process: an integration of past research and future directions. Int J Manag Rev 17:460–482
Malmendier U, Tate G (2005) CEO overconfidence and corporate investment. J Financ 60(6):2661–2700
Malmendier U, Tate G (2008) Who makes acquisitions? CEO overconfidence and the market's reaction. J Financ Econ 89(1):20–43
Maner JK (2016) Evolved social motives: when knowing about the past provides a window onto the present. In: Advances in motivation science, vol 3. Elsevier. pp 113–147
Maner JK, Mead NL (2010) The essential tension between leadership and power: when leaders sacrifice group goals for the sake of self-interest. J Pers Soc Psychol 99:482–497
Maner JK, Mead NL (2012) On keeping your enemies close: powerful leaders seek proximity to ingroup power threats. J Pers Soc Psychol 102(1):576–591
Marcel JJ (2009) Why top management team characteristics matter when employing a chief operating officer: a strategic contingency perspective. Strateg Manag J 30(6):647–658
March JG, Simon HA (1993) Organizations, 2nd edn. Blackwell, Malden
Mayew WJ (2008) Evidence of management discrimination among analysts during earnings conference calls. J Account Res 46(3):627–659
McClelland DC (1975) Power: the inner experience. Halsted Press, New York
Mehrabian A (1969) Significance of posture and position in the communication of attitude and status relationships. Psychol Bull 71(5):359–373
Miller KD, Chen WR (2004) Variable organizational risk preferences: tests of the March-Shapira model. Acad Manag J 47(1):105–115
Mohr A, Schumacher C (2019) The contingent effect of patriotic rhetoric on firm performance. Strategy Sci 4(2):94–110
Moskowitz DS (1990) Convergence of self-reports and independent observers: dominance and friendliness. J Pers Soc Psychol 58(6):1096–2011
Murray HA (1938) Explorations in personality. Oxford University Press, New York
Nadkarni S, Chen J (2014) Bridging yesterday, today, and tomorrow: CEO temporal focus, environmental dynamism, and rate of new product introduction. Acad Manag J 57(6):1810–1833
Norton R (1983) Communicator style: theory, applications, and measures. Sage Publications, Beverly Hills
Nyberg AJ, Fulmer IS, Gerhart B, Carpenter MA (2010) Agency theory revisited: CEO return and shareholder interest alignment. Acad Manag J 53(5):1029–1049
Ostrom E (1990) Governing the commons: the evolution of institutions for collective action. Cambridge University Press, Cambridge
Patil SH (2002) Community dominance and political modernisation: the lingayats. Mittal Publications, New Delhi
Pennebaker JW, Mehl MR, Niederhoffer KG (2003) Psychological aspects of natural language use: Our words, our selves. Annu Rev Psychol 54(1):547–577
Peterson RS, Smith DB, Martorana PV, Owens PD (2003) The impact of chief executive officer personality on top management team dynamics: one mechanism by which leadership affects organizational performance. J Appl Psychol 88(5):795–810
Petrenko OV, Aime F, Ridge J, Hill A (2015) Corporate social responsibility or CEO narcissism? CSR motivations and organizational performance. Strateg Manag J 37(3):262–279
Philbrick DR, Ricks WE (1991) Using value line and IBES analyst forecasts in accounting research. J Account Res 29(2):397–417
Powell TC, Lovallo DA, Fox CR (2011) Behavorial strategy. Strateg Manag J 32(13):1369–1386
Pugh DS, Hickson DJ, Hinings CR, Turner C (1968) Dimensions of organization structure. Adm Sci Q 4(1):65–105
Puranam P, Alexy O, Reitzig M (2014) What's "new" about new forms of organizing? Acad Manag Rev 39(2):162–180
Quigley TJ, Hambrick DC (2015) Has the "CEO effect" increased in recent decades? A new explanation for the great rise in america's attention to corporate leaders. Strateg Manag J 36(6):821–830
Rajan RG, Wulf J (2006) The flattening firm: evidence from panel data on the changing nature of corporate hierarchies. Rev Econ Stat 88(4):759–773
Rajan RG, Zingales L (2001) The firm as a dedicated hierarchy: a theory of the origin and growth of firms. Q J Econ 16(3):805–851
Ridge JW, Aime F, White MA (2015) When much more of a difference makes a difference: social comparison and tournaments in the CEO's top team. Strateg Manag J 36(4):618–636
Schneider B (1987) The people make the place. Pers Psychol 40(3):437–453
Schumacher C, Keck S, Tang W (2020) Biased interpretation of performance feedback: the role of CEO overconfidence. Strateg Manag J 41(6):1139–1165
Simon HA (1951) A formal theory of the employment relationship. Econometrica J Econ Soc 14:293–305
Smith A (1776) An inquiry into the wealth of nations. Strahan and Cadell, London
Szulanski G (1996) Exploring internal stickiness: impediments to the transfer of best practice within the firm. Strateg Manag J 17(2):27–43
Van Vugt M (2006) Evolutionary origins of leadership and followership. Soc Psychol Rev 63:182–196
Van Vugt M, Hogan R, Kaiser RB (2008) Leadership, followership, and evolution: some lessons from the past. Am Psychol 63(3):182–196
Vázquez XH (2004) Allocating decision rights on the shop floor: a perspective from transaction cost economics and organization theory. Organ Sci 15(4):463–480
Wiersema MF, Bantel KA (1992) Top management team demography and corporate strategic change. Acad Manag J 35(1):91–121
Wiggins JS (1979) A psychological taxonomy of trait-descriptive terms: the interpersonal domain. J Pers Soc Psychol 37(3):395–412
Williamson OE (1967) Hierarchical control and optimum firm size. J Polit Econ 3(1):123–138
Winter DG (2003) Personality and political behavior. Oxford University Press, New York
Winter DG (2005) Things I've learned about personality from studying political leaders at a distance. J Pers 73(3):557–584
Wulf J (2012) The flattened firm. Calif Manag Rev 55(1):5–23
Zhang Y (2006) The presence of a separate COO/president and its impact on strategic change and CEO dismissal. Strateg Manag J 27(3):283–300
Zhu DH, Chen G (2014) Narcissism, director selection, and risk-taking spending. Strateg Manag J 36(13):2075–2098