The Effects of CEO Type and Board Characteristics on the Benchmarking of CEO Compensation

by

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June 2026

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We have benefited from the comments of Yaniv Grinstein and the participants of the Ackerman Chair 2024 Meeting. Any remaining error is our own. Financial support from the Ackerman Family Center for Corporate Governance is gratefully acknowledged.

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Abstract

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JEL classification: G34, G38, J31, J33, M12, M52

Keywords: Benchmarking, CEO compensation, board of directors, compensation consultants.

1. Introduction

A common practice in CEO compensation design is benchmarking, in which a given firm compares its CEO compensation with the compensation of peer CEOs at similar companies. Previous empirical research has established that peer pay and benchmarking play an important role in determining CEO's total compensation (Albuquerque et al., 2013; Bizjak et al., 2011; Bizjak et al., 2008; Faulkender & Yang, 2010; and Laschever, 2013) and CEO's pay components and pay structure (Grinstein et al., 2022).

The central and most fundamental motive for CEO pay benchmarking is the need for human capital retention. A 'fair' pay relative to peers motivates the CEO to stay in the firm and exert efforts towards the firm's success (Holmstrom & Kaplan, 2003).

However, other motives and considerations may also play a role. For example, when a CEO's character, preferences and match with the firm are unknown or uncertain, setting CEO's pay based on the pay levels and pay structure of the median peer CEO may help the board to minimize deviations from an optimal compensation contract, especially in cases of newly hired and non-veteran CEOs. Francis et al. (2016) further suggest that providing the CEO with a contract that resembles that of her peers contributes to firm performance, especially when those peers are successful and can serve as a role model for the CEO.

In addition, benchmarking makes CEO's pay publicly defensible. Regulators, shareholders, proxy advisors and the media, closely examine the CEO pay and compare it to that of peers. Thus, benchmarking peer CEOs also serves directors to mitigate potential outside criticism and consequently protect their own (directors') reputation.

We employ extensive compensation data to examine the empirical relevance of these additional motives. Our sample comprises 7,688 firm-year (and 130,475 peer-year) observations on 1,440 unique firms included in the S&P Composite 1500 during 2006–2018.

We find that beyond retention, directors' cautiousness and information problems also shape benchmarking decisions. Consistent with the information opaqueness view, CEOs who the board knows and has experience with, veteran CEOs and owner CEOs in our tests, receive a pay that is relatively weakly benchmarked. Apparently, the board's acquaintance with the CEO affords a more tailor-made pay contract. However, the milder benchmarking of veteran and owner CEOs' pay might also reflect their power and domination over the board. Veteran and owner CEOs may resist and mitigate benchmarking, aspiring to set their own remuneration contract.

We also present evidence consistent with the contention that directors act cautiously and protect their reputation. Boards with a higher proportion of outside directors and/or a higher proportion of directors with multiple board assignments (for whom reputation concerns appear relatively strong) benchmark CEO compensation more vigorously, minimizing the likelihood of arduous outside criticism. However, the evidence on the impact of the board of directors' composition is also consistent with the view that directors with multiple board assignments (busy directors, henceforth) and outside directors feel less confident about their decisions regarding the firm because they have less information and/or less understanding of the firm's situation.[1] Thus, these directors act cautiously and rely more heavily on common practices - the pay contracts at peer firms.

[1] Busy directors' lack of information presumably reflects their lack of time given their many commitments and tough workload.

Our study contributes to the debate over the possible misuse or over-use of benchmarking. Previous studies (e.g. Faulkender & Yang, 2010; Bizjak et al., 2011 and Laschever, 2013) criticize benchmarking based on the possible manipulation of the peer group and the excessive weight assigned to benchmarking in CEO pay schemes (relative to the weight of firm performance). Others (Cabezon, 2022; and Jochem et al., 2021) warn about the convergence of the CEO pay structures (percentage of each pay component in total pay), possibly generated by over-utilization of benchmarking. We add another warning sign. By documenting the impact of information opaqueness and directors' cautiousness and reputation concerns on CEO pay benchmarking, we demonstrate that benchmarking may deviate from its unconditional ideal optimal level.

Our second contribution is more practical. We document the CEO type and board of director's composition effect on the aggressiveness of CEO pay benchmarking. Our evidence informs boards, consulting firms, regulators, proxy advisors, and the public about the existing norms of CEO pay benchmarking. It also affords a debate on the desirability and appropriateness of such norms.

Last, we present evidence relevant to the debate on the optimal composition of boards of directors. Consistent with recent research, Kotter & Larkin (2024), that documents the efficacy of insider directors in appointing a new talented CEO for the firm, we show that excess outside directors might lead to excessive pay benchmarking.

The rest of the paper is organized as follows. Section 2 presents the literature review and our hypotheses. Section 3 describes the data and the sample construction. Section 4 presents our empirical results and Section 5 concludes.

2. CEO Pay Benchmarking: Background and Hypotheses

2.1. The Benchmarking Practice

CEO pay benchmarking is a process of adjusting CEO's compensation towards that of a peer group of CEOs at similar firms, where "similarity" is typically interpreted as identical industry, similar firm size, and a common managerial reservoir (identified by past sources and destinations of the firm's executives). Existing research documents that the median CEO pay in the peer group helps explain CEO's pay (Bizjak et al., 2008; Faulkender and Yang, 2010; Bizjak et al., 2011; Albuquerque et al., 2013; and Laschever, 2013). There is also evidence that major pay components such as salary, non-equity performance pay and equity pay are benchmarked (Grinstein et al., 2022). Thus, benchmarking is a key determinant of CEO pay.

The commonly stated purpose of benchmarking is to provide the CEOs with a competitive market pay. A CEO who is compensated improperly may potentially resign from the company or neglect her duties. To retain valuable human capital, the company should follow the market compensation standards. The benchmarking of CEO compensation is a practical and efficient mechanism to gauge the market wage (Holmstrom & Kaplan, 2003).

A major concern about benchmarking is that it may be used to justify pay raises unrelated to the CEO or firm performance. Critics of the use of peer group benchmarking argue that powerful CEOs persuade compensation committees to select peer firms in a way that inflates CEO's pay (O'Reilly et al., 1988; Main et al., 1995; Newman & Mozes, 1999; and De Vaan et al., 2019). Indeed, there is evidence that boards select peers from larger companies and peers that are highly paid (Faulkender & Yang, 2010; Bizjak et al., 2011; and Laschever, 2013). Further, board directors

appear cooperative in biasing the peer group also because their own pay is positively correlated with the firm's CEO pay, the peer CEOs' pay, and the peer directors' pay – see Frye et al. (2024).

However, the extent of pay manipulation via benchmarking is unclear. Cadman & Carter (2014) do not find evidence for opportunistic selection of peers, and Larcker et al. (2021) assess that only in a third of their firm-year observations peers were selected opportunistically. Albuquerque et al. (2013) estimate that the CEO talent component of pay (approximated based on past abnormal performance, the size of the firms the CEO has managed in the past, and media coverage) dominates the self-serving component of pay. Last, Francis et al. (2016) suggest that some upward-bias in peer group composition may be beneficial. They find that firms that elected relatively skilled CEOs as their peer group exhibit superior performance. It is possible that choosing an upward biased (in terms of skill) peer group motivates the firm CEO to increase her work efforts in order to resemble and reach the achievements of her distinguished peers.

A more recent line of attack against benchmarking is the suggestion that it is excessive. Several studies (Faulkender & Yang, 2010; Bizjak et al., 2011; Albuquerque et al., 2013) demonstrate that the peer CEOs' median pay affects CEO pay more than firm's stock price performance. Further, Cabezon (2022) and Jochem et al. (2021) show that over time the CEO pay structure became more and more uniform across firms, perhaps due to the benchmarking of CEO's pay structure (Grinstein et al., 2022). The convergence of CEO's pay structures across firms appears suboptimal, as it is likely that "one size does not fit all".

2.2. Factors Affecting the Intensity of Pay Benchmarking and Its Mechanism

Extant literature highlights the role of CEO's total pay benchmarking in retaining valuable human capital (e.g., Holmstrom & Kaplan 2003). Fair pay is a necessary condition for the proper functioning of the CEO (Chaigneau et al., 2024).

However, fully efficient pay benchmarking is most probably unattainable. Restrictions impeding optimal benchmarking include incomplete information about the CEO and the board of directors' weaknesses (directors' cautiousness and reputation concerns). Following are some hypotheses on the impact of incomplete information and directors' cautiousness on the eventual chosen degree of CEO pay benchmarking.

2.2.1 Unobserved CEO Preferences and Character

CEO's character, preferences and match with the firm are gradually revealed over CEO's service at the helm. Thus, in the first years of CEO's service, the board and CEO might agree on a standard pay package, based on peers' median pay. Over time, as the acquaintance between the board and the CEO improves, benchmarking probably weakens and the CEO gets a tailor-made compensation contract, benefiting her and the firm.

The acquaintance with the CEO thesis also suggests that the compensation of owner CEOs (CEOs with a relatively large equity holdings in their firms) relies less on benchmarking. Owner CEOs are firm controllers or veteran CEOs that accumulated shares over their service). Thus, the board probably knows them relatively well. Based on the ability of boards of directors to observe CEO's personality and preferences, we advance:

Hypothesis 1: Benchmarking intensity is stronger for CEOs in their first years in office, and weaker for owner CEOs.

2.2.2. Directors' Cautiousness and Reputation Concerns

It is plausible that outside directors and directors who are in their first years of service in the firm recognize and understand the firm less than insider and veteran directors. Thus, such directors are rationally and naturally more cautious about complex issues such as the CEO pay. They may rely on veteran and insider directors' experience on such issues. However, a safer strategy for them is to retain external help in the form of a compensation consultant and adopt the consultant's advice. Another type of directors, busy directors, may lack the time to study the pay issues thoroughly, thus preferring consultants' help. Given that consultants typically build peer groups and employ benchmarking while advising on CEO pay, benchmarking becomes especially salient when cautious directors strongly adhere to the consultants' advice.

In addition, studies have shown that directors are often markedly concerned with their reputation (Jiang et al., 2016), as reputation governs their careers (Fama & Jensen, 1983; Yermack, 2004; and Chen et al., 2022). These concerns may lead directors to hedge potential risks of legal and social liabilities. To the extent that directors are worried that executive compensation may ignite a negative response in the media or social networks, they may lean heavily towards aligning CEO's pay with the standard pay level at comparable firms. Such a cautious hedging attitude may be more prevalent among less veteran directors, outside directors, and busy directors, whose good reputation is a key for their directorship careers.[2] Hence:

[2] Kotter & Larkin (2024) discuss the different attitudes of insider and outsider directors with respect to a new CEO appointment. Insider directors also worry about their reputation. However, relative to outside directors, they have more wealth invested in the firm, they must work daily with the incoming CEO, and their reputation and future career opportunities are more strongly linked to firm performance. Thus, inside directors have a relatively strong incentive to offer the CEO an efficient pay contract that benefits the firm and avoids excessive pay benchmarking.

Hypothesis 2: Boards of directors with a higher proportion of outside directors and busy directors benchmark CEO pay more aggressively. In contrast, a higher proportion of veteran directors mitigates pay benchmarking.

3. Samples and Data

We collect CEO compensation data for S&P Composite 1500 firms and their compensation peers in the years 2006–2018. On December 2006 the SEC introduced new amendments requiring firms to disclose their peer group when the use of peer groups is material in the pay setting process. Accordingly, peer group data have become available in definitive proxy statements (DEF 14A) since fiscal year 2006.

We focus on S&P 1500 executives classified as CEOs by the Standard & Poor's ExecuComp database, and extract from it these CEOs' compensation data. The initial sample comprises 21,943 firm-year observations. Since our main dependent variable is the CEO's pay change, we exclude 482 firm-year observations with no available compensation data for the current or previous year, and 91 observations with zero total compensation. We further drop 4,506 firm-year observations of CEOs who were replaced or appointed during the current or previous year, to exclude partial compensation or exceptionally high one-time payments (e.g., golden parachutes, severance pay, golden handshakes, and sign-on bonuses). This exclusion process reduces the sample size to 16,864 firm-year observations.

For each of the 16,864 firm-years, we search the list of compensation peers. We collect peer lists from three sources. Peer information for 2006 through 2008 is based on manually collected data from the Compensation Discussion and Analysis (CD&A)

section of the firms' proxy statements.[3] We construct peer lists for 2,293 firm-year observations based on the Albuquerque et al. (2013) dataset. Next, our peer data for 2009–2013 come from the Executive Compensation Analytics (ECA) database, provided by Institutional Shareholder Services (ISS).[4] We construct peer lists for 4,959 firm-year observations using the ECA database. Last, peer lists for 2014-2018 are collected from the firms' proxy statements, from which we extract data on 3,373 firm-year observations. In total, we attain an explicit list of peers for 10,625 firm-years.

Given our lists of peer CEOs, we seek current and prior year compensation data for 251,267 peer CEOs firm-year observations (peer-year observations, in short). Thus, there are on average approximately 24 peers for each CEO. Since some peers serve in foreign or private firms that are not covered by the ExecuComp or ISS databases, we find compensation data only for 194,138 peer-years.

We further exclude: a) 46 firm-years of focal firms that report only one or two peers; b) 849 firm-years with missing compensation data for 50% or more of their chosen peers;[5] c) 54 firm-years of co-CEOs; d) 1,949 firm-years of firms in the more regulated financial services industry (industries 45–48 in the Fama-French industry classification); and e) 39 suspicious firm-year observations, where one of the reported pay components is negative.

The final sample comprises 7,688 firm-year observations (and 130,475 peer-year observations) on 1,440 unique focal firms. Our final sample pay observations are distributed almost uniformly across the sample years, 2006-2018. The average (median) peer group for our sample firms comprises about 23 (19) firms. However, given missing

[3] We are grateful to Ana Albuquerque and her coauthors for providing us with these data. See Albuquerque et al. (2013) for the data description.
[4] The ECA database starts in 2008; however, we preferred to rely mainly on the dataset of Albuquerque et al. (2013) for ECA's first year (2008).
[5] We mark peer CEO pay as missing also in years when the peer CEO was replaced or appointed.

peer compensation data, the mean (median) number of peers with available compensation data per focal firm decreases to 18 (16). These mean and median number of peers are slightly higher than those reported in prior studies (e.g., Faulkender &Yang, 2012; Albuquerque et al., 2013).

We also employ stock return data, collected from the Center for Research in Security Prices (CRSP) database. Data on other variables (sales, ROA, market-to-book ratio, and financial leverage) that potentially explain CEO pay, are extracted from the Standard & Poor's Compustat database. Data on the CEO's name, age, percentage ownership and tenure in the firm are from the Execucomp database. The Execucomp database is also the source of the CEO duality variable, marking cases where the CEO serves also as Chairman of the board.

To test our hypotheses, we collect data on the board of directors' composition from the Execucomp and MSCI (formerly KLD and GMI) databases. Last, some of our robustness tests require data on generalist CEOs. [6] The General Ability Index of a large sample of U.S. CEOs in the period 2006-2016 was kindly provided by Professor Custodio.

Table 1 describes the sample. Notably, peer CEO pay statistics resemble those of the focal firm CEOs. For example, the average annual total compensation of our focal firm CEOs is 7.98 million dollars, while the average of the corresponding peer group median annual total compensation is 7.89 million dollars.

The mean (median) total assets of our focal companies is 7,311 (2,871) million dollars. The mean (median) logarithmic annual stock return is 12% (11%), and the mean (median) standard deviation of the firm's monthly stock returns over the preceding

[6] By definition, generalist CEOs have general managerial skills (a high General Ability score), whereas non-generalist CEOs possess firm-specific skills (Custodio et al., 2013).

three-years period, our proxy for firm risk, is 0.10 (0.09). Return on Assets (ROA) has a mean and median of 6% per year, market-to-book ratio has a mean (median) of 1.88 (1.27), and financial leverage, debt over total assets, has a mean (median) of 0.35 (0.32). The mean and median CEO age is 56.4 years, and 54% of the CEOs in the sample also hold the position of the Chairman of the board.

4. Empirical Findings

4.1. The Basic Benchmarking Model

The basic specification for explaining variations in CEO total compensation (Albuquerque et al., 2013; Bizjak et al., 2008; Faulkender & Yang, 2012, 2010; and Laschever, 2013) is :

$$(1)\ \mathrm{Ln}\left(\text{CEO compensation}_{i,t}\right) = \alpha_0 + \alpha_1 \mathrm{Ln}\left(\text{Sales}_{i,t-1}\right) + \alpha_2\left(\text{Stock return}_{i,t}\right) + \alpha_3\left(\text{Stock return}_{i,t-1}\right) + \alpha_4\left(\text{ROA}_{i,t}\right) + \alpha_5\left(\text{ROA}_{i,t-1}\right) + \alpha_6 \mathrm{Ln}\left(\text{Risk}_{i,t-1}\right) + \alpha_7\left(\text{MTB}_{i,t-1}\right) + \alpha_8\left(\text{Leverage}_{i,t-1}\right) + \alpha_9\left(\text{CEO Age}_{i,t}\right) + \alpha_{10}\left(\text{CEO Duality Dum}_{i,t}\right) + \alpha_{11}(\text{IndustryDum}_{i,t}) \times (\text{YearDum}_t) + e_{i,t}\ ,$$

where i indexes firms and t indexes fiscal years. The explanatory variables comprise the following firm and CEO characteristics: (i) the natural logarithm of firm sales in the previous year (a measure of firm size); (ii) stock returns and returns on assets (ROA) in years t and t-1 (firm's performance indicators); (iii) the natural logarithm of the standard deviation of the monthly stock return in the 36 months preceding the end of the previous fiscal year (represents firm's risk); (iv) lagged market-to-book (MTB) ratio (a proxy for growth opportunities); (v) lagged financial leverage; (vi) CEO age; and (vii) CEO duality (a dummy variable that equals 1 when the CEO also serves as Chairman of the board). More details on all the variables are provided in the Appendix. We further

include dummy variables for each unique combination of industry and year, using the 49 Fama and French (1997) industries. Last, e_{it} is a firm-year specific error term.

Fitting equation (1) in our sample yields:

$$\mathrm{Ln}(\text{CEO compensation}_{i,t}) = \alpha_0 + 0.39\mathrm{Ln}(\text{Sales}_{i,t-1}) + 0.21(\text{Stock return}_{i,t}) + 0.19(\text{Stock return}_{i,t-1}) + 0.025(\text{ROA}_{i,t}) - 0.41(\text{ROA}_{i,t-1}) - 0.064\mathrm{Ln}(\text{Risk}_{i,t-1}) + 0.058(\text{MTB}_{i,t-1}) - 0.06(\text{Leverage}_{i,t-1}) + 0.004(\text{CEO Age}_{i,t}) + 0.077(\text{CEO Duality Dum}_{i,t}) + \alpha_{11}(\text{IndustryDum}_{i,t}) \times (\text{YearDum}_t) + e_{i,t}\ .$$

Overall, the fitted CEO pay equation above is consistent with the findings of previous studies. For example, the coefficient of *lagged Ln(sales)* is positive and significant at the 1% level (see Tosi et al., 2000; Gabaix et al., 2014; and Edmans et al., 2017). The positive coefficient of the firm size proxy likely indicates that the managerial talent and skills needed for running larger and more complex firms are scarce and therefore command a higher compensation.

The coefficients of the firm's stock returns are positive and statistically significant, illustrating that CEOs are rewarded (punished) for good (poor) stock performance. The found pay performance relation is consistent with previous research evidence (Edmans et al., 2017). Further, the coefficients of the market to book ratio and the CEO age are positive and significant at the 5% level, and the coefficient on CEO duality dummy is positive and significant at the 1% level. However, the relation of total CEO pay to firm's accounting performance, estimated by the coefficients of ROA, is statistically insignificant, as is the coefficient of financial leverage.

Since benchmarking has predictions regarding the yearly changes in CEO pay, we start by differencing both the left- and the right- hand-side variables of equation (1). However, for parsimony, we keep only the explanatory variables that were significant

at the 1% level in the fitted CEO pay regression: sales, stock returns, and CEO duality.[7] To this parsimonious pay change model, we add a benchmarking term like that in Bizjak et al. (2008) and Grinstein et al. (2022). Our baseline benchmarking equation becomes:

$$(2)\ \Delta\mathrm{Ln}\left(\text{CEO total compensation}_{i,t}\right) = \beta_0 + \beta_1\mathrm{Ln}\left(\text{Relative level of CEO total compensation}_{i,t-1}\right) + \beta_2\Delta\mathrm{Ln}\left(\text{Sales}_{i,t-1}\right) + \beta_3\Delta\left(\text{Stock return}_{i,t}\right) + \beta_4\Delta\left(\text{Stock return}_{i,t-1}\right) + \beta_5(\text{IndustryDum}_{i,t}) \times (\text{YearDum}_t) + \varepsilon_{i,t}\ .$$

The dependent variable in equation (2) is the logarithmic change in CEO's total compensation, where i indexes firms and t indexes fiscal years. The first explanatory variable is the benchmarking variable, the natural logarithm of the median peer CEO total pay divided by the firm CEO total pay, both at year t-1. The implicit assumption is that the compensation committee and board of directors try to fix the previous year distortion in the firm CEO pay by narrowing the difference between the firm CEO pay and the median pay of peer CEOs. Other explanatory variables are: (i) the logarithmic change in firm sales from year t-2 to year t-1 (a measure of the change in firm size); and (ii) the changes in stock returns in years t and t-1 (representing changes in firm's performance). We further include dummy variables for each unique combination of industry and year, using the 49 Fama and French (1997) industries, and eit, a firm-year specific error term.

Column (1) in Panel B of Table 2 reports the fitted equation (2). All the coefficients are statistically significant. Of particular interest is the coefficient of the benchmarking term. It is positive and statistically significant at the 1% level. Its

[7] The 1% significance requirement appears to us appropriate given the large sample size. Similar results are obtained, and identical conclusions are reached, when we add the variables significant at the 5% level. In addition, when we difference the CEO pay equation to obtain our pay change model, the CEO Duality change is zero in 97.5% of the times; hence it is omitted.

magnitude, 0.38, implies that if last year the median peer CEO total compensation exceeded the firm CEO total compensation by 10%, this year firm CEO's total compensation is expected to be revised upwards by approximately 3.7% *ceteris paribus*, i.e., due to benchmarking considerations alone. The statistically and economically significant impact of benchmarking on CEO pay in our study is consistent with the findings of previous studies (Bizjak et al., 2011).

4.2. Tests of the Intensity of the CEO Pay Benchmarking

Tests of Hypotheses 1 and 2 are conducted by adding to our baseline benchmarking regression, equation (2), an interaction term constructed by multiplying our benchmarking measure, Ln(relative level of CEO total compensation), by a dummy variable that represents a factor suggested by one of our two hypotheses. For example, consider the interaction between the relative CEO total compensation and a dummy variable for non-veteran CEOs. If non-veteran CEO's pay is benchmarked relatively aggressively (weakly), the coefficient of the interaction term would be positive (negative) and statistically significant.

[Insert Table 2 about here]

4.2.1. Tests of Hypothesis 1: Unobserved CEO Preferences and Characteristics

Hypothesis 1 proposes a more aggressive pay benchmarking for CEOs in their first years in office and a weaker pay benchmarking for owner CEOs. This is because acquaintance with the CEO and her preferences affords tailoring a more efficient pay contract that relies less on benchmarking. Descriptive statistics of CEO tenure and ownership are presented in Panel A.

Column (2) in Panel B of Table 2 shows that pay benchmarking intensity is higher for CEOs in their first years of service. We define non-veteran CEOs as CEOs

with below or equal to 6 years (our sample-median) of tenure within the firm. The estimated coefficient on the interaction term with non-veteran CEOs is positive and highly statistically significant. This evidence supports Hypothesis 1, and it is also consistent with previous evidence. Bizjak et al. (2008) find that more veteran CEOs are less likely receive a pay raise that bumps them from below to above their peer group median pay, and Edmans et al. (2023) report that board members mention peer pay as a leading factor in setting the pay of a new CEO yet consider it a far less important determinant of incumbent CEO pay.

A similar logic applies to benchmarking the total pay of owner CEOs. We define owner CEOs as CEOs who hold 4.3% or more of the firm's total shares outstanding, where the 4.3% ownership represents the 90th percentile of CEO ownership in our sample. Owner CEOs typically are founder or veteran CEOs within their firms. We interact CEO's relative total compensation with a dummy variable that equals 1 if the CEO is an owner CEO, and 0 otherwise. Consistent with Hypothesis 1, the interaction term coefficient in Column (2) is negative and statistically significant, indicating that pay benchmarking intensity is weaker for owner CEOs.

On reflection, our findings in column (2) may also be interpreted in an alternative way. Owner CEOs and veteran CEOs are probably entrenched CEOs with relatively strong power inside their firms. They may control director appointments and overshadow the board. The pay of such CEOs is probably higher and more generous than that of the peer group CEOs. Hence, benchmarking their pay may require pay cuts that these powerful CEOs obviously resist. In short, the power and perhaps rent seeking behavior of (some) owner CEOs and of (some) veteran CEOs may also explain why their firms benchmark their pay relatively mildly.

4.2.2. Tests of Hypothesis 2: Directors' Cautiousness and Reputation Concerns

Hypothesis 2 proposes that directors with a higher cautiousness and stronger reputational concerns prefer and lead the board of directors to a tighter benchmarking of CEO pay. We assume that outside directors are more cautious (due to their relatively inferior information and understanding of the firm) and more concerned about the effect of the public's response to CEO pay on their own reputation. Panel A shows that the mean (median) percentage of outside directors on the board is 76.4% (80.0%, respectively). Given that a typical board size of 7-9 members, on average the board comprises six outside and two inside directors. This illustrates the dominance of outside directors on the board. Further, on many boards there is only one inside director, most probably the CEO, who naturally is unable to discuss her own pay. Thus, outside directors' dominance in setting CEO's pay is sometimes absolute.

In column (3) of Table 2, Panel B, we examine the effect of outside directors by adding an interaction term between relative CEO total compensation and a dummy variable that equals 1 for boards with above median percentage of outside directors (and equals 0 otherwise). Consistent with Hypothesis 2, the interaction term coefficient is positive and highly statistically significant. This evidence indicating a more intense pay benchmarking by boards with a higher proportion of outside directors is also consistent with the evidence in Bizjak et al. (2008) that an independent board (with a majority of outside directors) is more likely to raise CEO's pay from below to above their peer group median.

In Column (3) we also examine Hypothesis 2's prediction that a higher proportion of veteran directors mitigates benchmarking. We argue that veteran directors have an established reputation and sufficient knowledge; hence their reputational concerns and cautiousness may be muted to a point where they can afford milder

benchmarking. We define veteran directors as directors with over ten years tenure. Panel A of Table 2 reports that about a third of our sample firms' directors are veteran directors. The average (median) percentage of veteran directors is 34.5% (33.3%, respectively). We interact relative CEO pay with a dummy variable that equals 1 for firms with above median percentage of veteran directors. Column (3) documents the negative and statistically significant coefficient of the interaction term between veteran directors and relative pay component. Consistent with Hypothesis 2, it appears that a veteran director does not rely on peer pay data as much as her less veteran director does.[8]

Last, we examine Hypothesis 2's prediction that occupied directors with limited time availability, busy directors (defined by us as directors who hold seats on more than four boards), rely more on benchmarking. Consistent with this prediction, in column (3) the coefficient of the interaction term between the relative CEO total compensation and a dummy variable for firms with above median percentage of busy directors is positive and statistically significant at the 10% level.[9] It appears that busy directors rely more on benchmarking.

Column (4) reports results of a regression that includes all five CEO and board interaction terms. The effects of the CEO type variables, CEO tenure and ownership, remain statistically significant at the 1% level. Likewise, the effects of the percentage of outside directors and the percentage of busy directors remain statistically significant. However, the effect of the percentage of veteran directors loses its statistical significance. We check and find that the interaction term of the percentage of veteran

[8] It is noteworthy that in our later more-elaborated analysis the effect of veteran directors becomes statistically insignificant.

[9] The median percentage of busy directors in our sample is zero – see Panel A. Consequently, our dummy variable for above median percentage of busy directors is essentially a dummy variable for the presence of a busy director on the board.

directors has relatively high correlations with all other interaction terms. Thus, it is possible that multicollinearity problems diminish its effect. However, conservatively, we omit the percentage of veteran directors from the rest of the analysis.

Column (5) reports the results of a summary parsimonious pay benchmarking regression. Consistent with hypotheses (1) and (2), significant effects of CEO type and board characteristics are documented. These findings suggest to us that CEOs do not receive the optimal compensation contract, where the optimal compensation contract is the pay contract the CEO would get when the board has full information (all the relevant information) about the CEO and when the board is extremely professional and proficient in executive pay design. Our evidence suggests that information problems, i.e. lack of sufficient acquaintance with the CEO, lead the board of directors to a pay scheme that relies perhaps excessively on peer CEO pay. Likewise, the directors' cautiousness and reputational concerns restrict the efficacy of the CEO pay contract by potentially steering the board to embrace a tighter than needed benchmarking scheme.

Our evidence of the potentially inefficient pay benchmarking adds to the previous research criticism of CEO pay benchmarking (e.g., Cabezon, 2022; Jochem et al., 2021; Faulkender & Yang, 2010; Bizjak et al., 2011; and Laschever, 2013). It appears that CEO pay benchmarking is a delicate process, prone to numerous pitfalls.

Remedies to excessive benchmarking include better information about the CEO and a sounder composition of the board of directors. The compensation committee of the board should strive to deepen its recognition with the CEO and her personality and work attitude while the nomination committee of the board should try to resolve the board's weaknesses. For example, appointing at least one non-CEO insider as a director might add to the board important perspectives on the CEO's "optimal" pay contract. Nevertheless, some problems would probably remain, as, for example, the "inefficient"

board composition with respect to CEO pay design might be efficient for other board of directors' tasks. Thus, at best, the claim may be that the CEO pay is conditionally efficient, i.e., optimal given the existing unresolvable restrictions.

4.2.3. Robustness Tests

In some cases, the benchmarking of CEO's pay appears more crucial. Consider, for example, generalist CEOs, CEOs with strong general managerial skills. Generalist CEOs are presumably more mobile, hence retaining them is more difficult and requires more meticulous pay benchmarking. Is the compensation of generalist CEOs benchmarked more aggressively?

We define a generalist CEO as a CEO whose *General Ability Index* score is above the yearly median[10], and employ the empirical methodology used in Table 2 to test the impact of a Generalist CEO on pay benchmarking intensity. We construct a dummy variable equal to 1 for generalist CEOs (and equal to zero otherwise) and interact it with the benchmarking variable (relative compensation). Then we add this interaction term to the parsimonious model presented in column (5) of Table 2.

The first column of Table 3 documents our generalist CEO findings. The coefficient of the interaction term between relative pay and the generalist CEO dummy variable is positive yet statistically insignificant. The compensation of generalist CEOs is not more tightly benchmarked. This finding illustrates that more careful benchmarking, as in the case of a generalist CEO, does not necessarily breed more aggressive pay benchmarking.

[Insert Table 3 about here]

[10] The *General Ability Index* is developed in Custodio et al. (2013), and it measures CEO's general managerial skills.

Cremers and Grinstein (2014) advocate adding lagged CEO compensation as an explanatory variable to the CEO pay benchmarking regression, arguing that this addition controls for the positive autocorrelation of executive pay across time. Column (2) reports the results of such an addition. The coefficient of lagged CEO compensation is negative and statistically significant at the 1% level, consistent with the arguments and evidence of Cremers and Grinstein (2014). However, the coefficients of all the benchmarking interaction terms remain statistically significant at the 1% level and are almost identical to those of our summary pay benchmarking model in column (5) of Table 2. Evidently, CEO's pay benchmarking intensity is affected by both the board structure and the CEO characteristics.

Columns (3) and (4) in Table 3 present results of running the parsimonious pay benchmarking regression in two subperiods: 2006-2011, and 2012-2018. The coefficients describing the effect of CEO tenure and CEO ownership appear stable over time, i.e. are similar in columns (2) and (3). However, the coefficients describing the effect of the board composition vary across the subperiods. Interestingly, over time the effect of busy directors weakens while the effect of outside directors strengthens.

The busy directors' evidence is intriguing. The finding in column (2) that in the first subperiod boards with busy directors benchmark their CEO's pay aggressively, suggests that in that period busy directors lack time and prefer the quick and easy solution of excessive benchmarking. This evidence is not surprising, as it is consistent with previous evidence on the negative impact of busy directors on firm performance (Core et al., 1999; Fich & Shivdasani, 2006; and Hauser, 2018).

However, some busy directors are skillful individuals, able to serve prudently on all their boards and some busy directors may have the expertise, experience, and self-confidence to set the CEO pay without relying excessively on benchmarking. The

second subperiod results are consistent with such well-functioning busy directors. In the second subperiod (2012-2018) the effect of busy directors is statistically insignificant, i.e., there is no evidence that busy directors are associated with excessive benchmarking. Field et al. (2013) argues that busy directors are selected when the firm needs the director's expertise rather than her time. It is possible that in the later subperiod in many public firms at least one busy director was proficient in executive compensation and advised the board against excessive benchmarking.

The subperiod evidence regarding the effect of the percentage of outside directors on the board is also interesting and thought provoking. In the first subperiod outside directors do not appear to impact the degree of benchmarking whereas in the later subperiod outside directors tighten benchmarking significantly. Why did outside directors become more cautious or reputation-protective in the later subperiod (2012-2018)? A possible conjecture that it is because of the Great Recession period and the subsequent Dodd-Frank and Say-on-Pay regulation of 2010 and 2011. The increased public sensitivity to executive compensation issues might have driven some directors towards excessive reliance on pay benchmarking. It is noteworthy though that a comparison of the subperiod results in columns (2) and (3), reveals that the coefficient of the general benchmarking variable, *Ln(relative level of total compensation)*, almost does not change between the first and second subperiod. Hence, our evidence does not support the contention that in general, i.e., for all firms, benchmarking strengthened in the later subperiod following the Say-on-Pay regulation.

5. Summary and Conclusions

We examine factors that may affect the extent of CEO pay benchmarking. Using a sample of 1,440 S&P 1500 firms in 2006-2018 we find that CEO characteristics and

board of directors' composition significantly affect the aggressiveness of CEO's pay benchmarking. CEO pay is relatively tightly adjusted to that of her peers when the percentage of outside directors and busy directors on the board is relatively high. In contrast, CEOs who the board is more acquainted with, veteran CEOs and owner CEOs, receive a pay that relies less on benchmarking peers' pay.

Our finding that CEO characteristics and board composition affect benchmarking intensity suggests to us that CEOs do not receive the optimal compensation contract, where the optimal compensation contract is the pay contract the CEO would get when the board has full information (all the relevant information) about the CEO and when the board is extremely professional and proficient in executive pay design. Our evidence suggests that information problems, i.e. lack of sufficient acquaintance with the CEO, lead the board of directors to a pay scheme that relies perhaps excessively on peer CEO pay. Likewise, the outside directors' cautiousness and reputational concerns restrict the efficacy of the CEO pay contract by potentially embracing tighter than needed benchmarking.

One may argue though that the CEO pay is rational given the information available to the board and given the appointed directors' qualifications. However, even this thesis of a conditionally efficient CEO pay contract can be criticized. For if the directors' selfish cautiousness and reputational concerns dominate the board decisions, it is possible that the board would "over-benchmark," i.e. adopt an even higher level of benchmarking than the conditionally efficient benchmarking process requires.

It is also noteworthy that deviations from CEO pay contract optimality are not always in the direction of excessive pay benchmarking. Our finding that the pay of owner CEOs (CEOs whose equity holdings in the firm are relatively large) is mildly benchmarked raises concerns that sometimes benchmarking is too weak. Owner CEOs

are powerful and relatively entrenched. They may have excessive power to control their own pay, and if their pay is inflated, they obviously resist benchmarking peers' pay.

Remedies to inefficient benchmarking should include processes that achieve better acquaintance with the CEO and less reliance on outside and busy directors. It appears that appointing at least one skilled non-CEO inside director to the board of directors, as suggested by Kotter & Larkin (2024), could contribute to the efficacy of CEO pay. In addition, public shareholders should receive greater control over the pay of CEOs with large ownerships because such owner CEOs effectively control the firm and its board.

Future studies should further explore our and other factors that may affect the benchmarking of CEO pay. Hopefully such research will lead to better understanding of benchmarking and to a better guide to the boards on how to use it properly. Future research may also inquire the role of compensation consultants and regulators in optimizing the pay benchmarking process.

Appendix: Variables' Definition

Variable	Definition and source
I. The benchmarking variable:	
Ln(relative level of total compensation)	A benchmark measure defined as the natural logarithm of the median peer group CEO total compensation divided by firm CEO total compensation, both at year t-1.
II. The compensation variable:	
CEO's annual total compensation at focal firms (in thousand dollars)	CEO's annual total compensation is the sum of salary, bonus, option awards, stock awards, non-equity incentive plan compensation, change in pension value and non-qualified deferred compensation earnings, and all other compensation. This compensation data are disclosed in the summary compensation table of each public firm since December 2006 (Execucomp data item TOTAL_SEC, and ECA variable name DisclosedTotalCompensation).
III. Control Variables	
CEO age (years)	The age of the CEO in years.
CEO Duality dummy	A dummy variable equal to 1 when the CEO is also the Chairman of the board (and 0 otherwise).
Leverage	Total liabilities (Compustat data item LT) divided by the sum of total liabilities and the market value of equity (Compustat data items LT+CSHO*PRCC_F) at the end of year t.
Sales (in million dollars)	Firm's sales revenue in millions of Dollars in year t (Compustat data item SALE).
Monthly return standard deviation	The standard deviation of the monthly stock returns in the thirty-six months preceding the end of the previous fiscal year.
Market-to-book value	The ratio of market value of equity to the book value of equity at the end of year t (Compustat data items [CSHO*PRCC_F+TL+PSTKL-TXDITC]/AT).
Return on Assets (ROA)	Return on assets calculated as the ratio of income before extraordinary items (Compustat data item IB) to total assets (Compustat data item AT) in year t.
Annual stock return	The stock return including dividends (Compustat data item RET) for the current fiscal year (year t).
IV. CEO and Board characteristics	
Percentage of total shares outstanding held by the CEO	Percentage of total shares outstanding held by the CEO (Execucomp data item SHROWN_TOT_PCT).
CEO tenure	The number of years the CEO has been in the position. The tenure is calculated as the difference between current fiscal year end and the date on which a CEO became CEO (Execucomp data item BECAMECEO).

General Ability Index of CEO	An index measures CEO's general managerial skills and developed in Custodio et al. (2013).
Percentage of outside directors	The percentage of outside directors is calculated by dividing the number of outside directors on the board by the total number of board members, both from the MSCI (formerly KLD and GMI) database.
Percentage of veteran directors (over 10 years tenure)	The percentage of veteran directors is calculated by dividing the number of directors with over 10 years of tenure by the total number of board members, both from the MSCI (formerly KLD and GMI) database.
Percentage of busy directors who hold seats on more than four boards	The percentage of busy directors is calculated by dividing the number of directors who hold seats on more than four boards by the total number of board members, both from the MSCI (formerly KLD and GMI) database.

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Table 1: Descriptive Statistics

The sample comprises 7,688 firm-year observations on CEOs of S&P 1500 firms in 2006–2018. Definition of and details on all variables are provided in the Appendix. All variables are winsorized at the 2.5th and 97.5th percentiles.

	Mean	Standard deviation	Median	Number of obs.
CEO's annual total compensation at focal firms (in thousand dollars)	7,983	6,020	6,380	7,462
Median peer CEO annual total compensation (in thousand dollars)	7,894	4,559	6,972	7,462
Sales (in million dollars)	7,311	27,650	2,871	7,653
Annual stock return	0.12	0.46	0.11	7,642
Return on Assets (ROA)	0.06	0.09	0.06	7,663
Monthly return standard deviation	0.10	0.05	0.09	7,432
Market-to-book ratio	1.88	1.27	1.60	7,067
Leverage	0.35	0.20	0.32	7,639
CEO Duality dummy	0.54	0.50	1.00	7,215
CEO age (years)	56.36	6.51	56.00	7,667

Table 2: Do CEO Characteristics and Board of Directors' Composition Affect CEO Pay Benchmarking?

The sample comprises 7,688 firm-year observations on CEOs of S&P 1500 firms in 2006–2018. Panel A describes our sample CEO characteristics and board of directors' composition. Regression 1 of Panel B reports the results of fitting our baseline pay benchmarking model (equation 2). Regression 2 adds to the baseline model the interaction between the relative CEO pay and dummy variables for CEO characteristics. Regression 3 adds the interaction between the relative CEO pay and dummy variables portraying the Board of Directors' composition. Regression 4 adds to the baseline model both the CEO and the board interaction terms, and regression 5 is the parsimonious version of regression 4. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Definition of and details on all variables are provided in the Appendix.

Panel A: Descriptive statistics of CEO's characteristics and board of directors' composition

	Mean	Std. dev.	Median	N
Percentage of total shares outstanding held by the CEO	1.96%	4.83%	0.59%	7,013
CEO tenure (years)	7.96	6.47	6	7,505
Percentage of outside directors	76.4%	14.3%	80.0%	7,184
Percentage of veteran directors (over ten years tenure)	34.5%	21.1%	33.3%	7,186
Percentage of busy directors who hold seats on more than four boards	2.3%	6.1%	0%	7,184

Table 2 – Continued

Panel B: The effect of CEO characteristics and board of directors' composition

	Change in Ln (CEO total compensation)				
	(1)	(2)	(3)	(4)	(5)
Intercept	-0.160 (0.182)	-0.159*** (0.024)	-0.196 (0.187)	-0.219*** (0.052)	-0.201*** (0.044)
Change in lagged Ln(sales)	0.087** (0.040)	0.092** (0.043)	0.095** (0.042)	0.102** (0.045)	0.103** (0.045)
Change in stock return	0.117*** (0.013)	0.100*** (0.015)	0.115*** (0.014)	0.099*** (0.015)	0.099*** (0.015)
Change in one-year lagged stock return	0.122*** (0.012)	0.114*** (0.013)	0.117*** (0.013)	0.111*** (0.013)	0.111*** (0.013)
Ln(relative level of total compensation)	0.383*** (0.014)	0.370*** (0.021)	0.371*** (0.026)	0.333*** (0.035)	0.313*** (0.025)
Ln(relative level of total compensation)×Dummy for CEOs with tenure equal or below the median of 6 years		0.073*** (0.027)		0.076*** (0.028)	0.081*** (0.028)
Ln(relative level of total compensation)×Dummy for owner CEO		-0.189*** (0.037)		-0.160*** (0.039)	-0.161*** (0.039)
Ln(relative level of total compensation)×Dummy for above median percentage of outside directors			0.102*** (0.026)	0.081*** (0.028)	0.085*** (0.027)
Ln(relative level of total compensation)×Dummy for above median percentage of directors with over 10 years tenure			-0.072*** (0.027)	-0.025 (0.029)	
Ln(relative level of total compensation)×Dummy for above median percentage of directors who hold seats in more than 4 boards			0.067* (0.036)	0.094** (0.038)	0.096** (0.038)
Year × Industry FE		Yes	Yes	Yes	Yes
Observations	7,504	6,310	7,048	5,969	5,969
Adjusted R^2	0.259	0.260	0.266	0.268	0.268

Table 3: Robustness Tests of CEO Pay Benchmarking Intensity

The sample comprises 7,688 firm-year observations on CEOs of S&P 1500 firms in 2006–2018. Regression 1 reports the results of adding an interaction term between the relative CEO pay and a dummy variable for generalist CEOs to our parsimonious model presented in column (5) of Table 2. Regressions 2 and 3 present results of running our parsimonious model in two subperiods: 2006-2011, and 2012-2018, respectively. Standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Definition of and details on all variables are provided in the Appendix.

	Change in Ln (CEO total compensation)			
	(1)	(2)	(3)	(4)
Intercept	-0.165***	0.229***	-0.240***	-0.249
	(0.050)	(0.089)	(0.059)	(0.225)
Change in lagged Ln(sales)	0.064	0.094**	0.051	0.156**
	(0.051)	(0.045)	(0.063)	(0.062)
Change in stock return	0.101***	0.099***	0.086***	0.116***
	(0.016)	(0.015)	(0.020)	(0.023)
Change in one-year lagged stock return	0.118***	0.110***	0.109***	0.110***
	(0.014)	(0.013)	(0.017)	(0.022)
Ln(relative level of total compensation)	0.290***	0.256***	0.324***	0.302***
	(0.029)	(0.027)	(0.031)	(0.037)
Ln(relative level of total compensation)×Dummy for CEOs with tenure equal or below the median of 6 years	0.078***	0.084***	0.075**	0.084**
	(0.029)	(0.028)	(0.036)	(0.042)
Ln(relative level of total compensation)×Dummy for owner CEO	-0.137***	-0.167***	-0.154***	-0.175***
	(0.041)	(0.039)	(0.049)	(0.066)
Ln(relative level of CEO total compensation)×Dummy for a generalist CEO	0.0346			
	(0.0322)			
Ln(relative level of total compensation)×Dummy for above median percentage of outside directors	0.049*	0.092***	0.042	0.124***
	(0.029)	(0.027)	(0.035)	(0.038)
Ln(relative level of total compensation)×Dummy for above median percentage of directors who hold seats in more than 4 boards	0.092**	0.102***	0.130**	0.057
	(0.041)	(0.038)	(0.053)	(0.050)
Ln(lagged level of total compensation)		-0.053***		
		(0.01)		
Year × Industry FE	Yes	Yes	Yes	Yes
Observations	4,586	5,969	2,591	3,378
Adjusted R^2	0.270	0.272	0.291	0.242