JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS Vol. 60, No. 7, Nov. 2025, pp. 3514–3550
© THE AUTHOR(S), 2025. PUBLISHED BY CAMBRIDGE UNIVERSITY PRESS ON BEHALF OF THE MICHAEL G. FOSTER SCHOOL OF BUSINESS, UNIVERSITY OF WASHINGTON
doi:10.1017/S0022109025000018

Value-Based CEO Equity Grants

Jin Xu
Virginia Tech Pamplin College of Business
xujin@vt.edu (corresponding author)

Pengfei Ye
Virginia Tech Pamplin College of Business
pye@vt.edu

Cheng Zhang
Shanghai University of Finance and Economics
zhangcheng@mail.shufe.edu.cn

Abstract

We document firms often determine CEO equity grants based on a predetermined dollar value (value-based equity grant) instead of on the number of shares (share-based grant). Value-based equity grants weaken the relationship between stock performance and CEO equity pay, lower CEO portfolio delta, and slow firms' investment in R&D. We find that retention pressure is a key reason for the use of value-based equity pay, while governance could also matter. Overall, this paper alerts boards to the unintended consequences of pursuing a target pay level or pay structure because such practices can lead to value-based equity grants in CEO compensation.

I. Introduction

Equity has become a dominant component of CEO compensation in the past 3 decades due to its ability to align the interests of managers and shareholders (Hall and Liebman (1998)). Each year, a firm can award its CEO either a certain number (*share-based*) or a given dollar value (*value-based*) of equity grants. Under a share-based equity grant, the number of shares a CEO receives is predetermined, and the total dollar amount of equity on the grant day is an increasing function of the stock price. This relationship is in line with the classical incentive contract models (e.g., Holmstrom and Milgrom (1987), Gabaix and Landier (2008)), which hold that steeper incentives should be offered to CEOs with greater marginal productivity. In contrast, under a value-based equity grant, the value of the grant is predetermined and the number of shares of stock or options a CEO receives is derived from the given value and the grant-day stock price (and the parameters of the options). As such, a value-based equity grant generates a negative relationship between recent

We thank Kai Li (the editor), an anonymous referee, Don Bowen, Felipe Cabezon, Zhaohui Chen (Discussant), David Denis, Diane Denis, Roger Edelen, Eli Fich, Michael Gallmeyer, Iftekhar Hasan, Raman Kumar, Katharina Lewellen, Michelle Lowry, Andrew McKinlay, S. Drew Peabody (discussant), Yiming Qian, Vijay Singal, Yihui Wang, Jun Yang and participants at the Boca Conference, Commonwealth Finance Conference, Fordham University, University of Wisconsin-Milwaukee, and Virginia Tech for great suggestions. All errors remain our own.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

stock performance and the number of shares granted: A CEO whose firm has performed better receives fewer shares on the grant day. Such a relationship is problematic because it violates optimal incentive design.

Three compensation practices can lead to value-based equity grants. The first and most obvious is fixing the dollar amount of equity grants during the span of a multi-year contract (the *fixed-value* equity plan). This practice is first noticed by Hall (1999), although his focus is on option grants. In this study, we extend Hall's definition and consider any compensation contract as a "fixed-value equity plan" if the dollar amount of option grants, stock grants, or total equity pay is prefixed. During our sample period from 2006 to 2022, about 22.7% of ExecuComp firm-years use fixed-value equity plans.

The other two pay practices, although commonly observed, are less obvious than the first. Specifically, the second practice is presetting the pay structure of a CEO's compensation (*preset pay structure*) – that is, presetting the ratio of values between equity and total pay, or between different components of equity pay. Consider a compensation contract in which 50% of the equity grants is in common stock and 50% is in options. Because the price movements of stock and options are volatile, and their relationship is irregular, a pay structure such as this is highly unlikely under a share-based equity grant. Except for coincidences, the only way to achieve a regular or fixed pay structure is to preset the dollar amounts of stock and option grants in the contract (i.e., value-based equity grants). We find that about 40.6% of our sample firm-years preset the pay structure of their CEOs' compensation.

The third value-based practice is *strict pay tracking*, in which the board pre-selects a compensation benchmark and closely tracks its CEO's compensation on this benchmark. When a firm's stock price does not perfectly correlate with those of the firm's benchmark companies, presetting the total value of CEO equity grants (along with non-equity pay) is the most effective way for tracking purposes. About 57.1% of our sample firm-years practice strict pay tracking.

Value-based equity grants from the above practices can affect executive incentives via two distinct channels. First, value-based equity grants can weaken the ex post pay-performance sensitivity, leading to a "pay without performance" effect. This is because under a value-based practice, the dollar amount of equity pay is often determined by factors unrelated to the firm's past performance. For example, under a multi-year fixed-value contract, the total amount of equity pay is fixed regardless of the stock performance. Using the empirical model of Murphy (1985) and Bertrand and Mullainathan (2001), we find strong evidence that value-based practices can lead to equity pay without performance.

Second, a value-based equity grant can weaken a CEO's ex ante incentives. Recall that a value-based equity grant incurs an inverse relationship between stock performance and the number of shares granted: When the stock performs better, the CEO receives fewer shares. We check the data and confirm this is true for all three value-based practices. Moreover, under persistent value-based grants, this periodic effect can build up and manifest in the portfolio holdings of a CEO, eventually lowering her portfolio delta (ex ante pay-performance sensitivity). We find strong empirical evidence supporting this effect as well.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

The weakened CEO incentives may discourage CEOs from exerting more effort to increase a firm's value. To explore the real consequence of these value-based practices, we examine their impact on corporate R&D investment decisions, as innovation has been shown to both require tremendous effort and enhance firm value and growth (e.g., Kogan, Papanikolaou, Seru, and Stoffman (2017), Edmans, Fang, and Lewellen (2017)). We introduce two identification strategies to address potential endogeneity concerns in this analysis.

In the first strategy, we focus on multi-year fixed-value plans as an example of value-based equity grants. We utilize the fact that firms on fixed-value plans tend to use repeated cycles of equal length (Shue and Townsend (2017b)). This repeating tendency isolates the variation in the timing of fixed-value contracts that is likely predetermined and thus largely exogenous. Based on this idea, we introduce a dummy variable, *Extrapolated Fixed Value*, that equals 1 for 3 (2) years following a completed cycle of a 3-year (2-year) fixed-value contract, and 0 otherwise. We then use this variable as an instrumental variable (IV) for fixed-value plans to estimate the effect of value-based equity grants on R&D investment policy. Consistent with a weakened CEO incentive to invest, we find that fixed-value plans lead to significantly lower R&D investment growth. We obtain this result in both an OLS model and the 2-stage least squares (2SLS) model, while controlling for the actual level and structure of CEO compensation and other firm and CEO characteristics.

Our second strategy focuses on the practice of presetting pay structure and exploits a mandatory vote on the frequency of say-on-pay (SOP) for identification. In early 2011, with very few exceptions, the SEC required shareholders of public firms to hold advisory votes on executive compensation. However, they must also vote on the frequency of SOP which typically ranges from once per year to once every 3 years. We posit that a frequent SOP (i.e., once a year) will push the board to adopt a preset pay structure. In a recent survey by Edmans et al. (2022), they find that institutional investors – the most active shareholders participating in proxy voting – tend to pay more attention to the incentive design than to the CEO's compensation level. Without a preset pay structure such as a constant equity-to-total pay ratio, CEO incentive pay can appear volatile, changing every year along with stock price fluctuations. As such, when the say-on-pay vote is more frequent, the board is more likely to use a preset pay structure to minimize possible confusion and questions about the compensation design. We thus use the vote for once-a-year SOP frequency as an IV for preset pay structure. We confirm empirically that this variable is strongly related to a firm's likelihood of presetting its pay structure. And there is no clear economic reason to link this voting outcome directly to a firm's R&D investment, as an SOP frequency vote is not a vote on executive compensation per se. Results from both OLS and 2SLS analyses suggest that presetting pay structure leads to lower R&D investment growth, which is again consistent with a negative incentive effect of value-based equity pay.

In the final part of this paper, we examine why boards adopt these incentive-weakening pay practices. We specifically focus on the roles of retention pressure and corporate governance. Retention is often claimed as the key reason for pay tracking, though this claim has not been formally tested (Gabaix and Landier

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

(2008), Bizjak, Lemmon, and Nguyen (2011)).[1] Retention could also motivate the use of preset pay structure because such a practice facilitates the comparison of a firm's pay structure with its peers. Furthermore, value-based equity grants could help with retention because they reduce compensation risk, which appeals to risk-averse executives. Drawing upon the literature, we introduce four sets of variables to measure a firm's retention pressure. The sets represent i) the external demand condition for the incumbent CEO; ii) the depth of the internal and external supply pools of executive talents; iii) the CEO's personal marketability; and iv) the CEO's skill portability. We find that these firm-, CEO-, and firm-CEO pair-specific variables are significantly associated with a firm's likelihood of paying equity based on a predetermined value: The greater the retention pressure, the more likely a firm is to use a value-based equity plan.

To further establish a causal link, we exploit headquarters relocations. Previous studies show that a firm's managerial labor market conditions can be affected by its geographic location (e.g., Yonker (2017)). We introduce a dummy variable, *Move to More Firms*, as an IV for retention pressure. It equals 1 if a firm moves its business headquarters to a new location near which more S&P 1500 firms are headquartered, and 0 otherwise. We show that *Move to More Firms* increases a firm's retention pressure – an effect closely related to the changed demand for and supply of CEO talent. Yet, there is no reason to believe that headquarters relocation is driven by executive compensation policies, or that it is likely to affect compensation design through a channel other than labor market conditions. We find that under this IV regression analysis, the effect of retention continues to hold. Furthermore, the effect becomes stronger when we focus on the first 3 years after relocation.

Finally, we investigate the role of corporate governance in motivating firms to pay equity by value. It is well-documented that entrenched CEOs can manipulate pay-setting mechanisms for their own benefit (see, e.g., Bebchuk and Fried (2003), (2005), Faulkender and Yang (2010), (2013)). Value-based equity grants could be attractive to entrenched CEOs because the value of pay is more certain under these grants than under the share-based method (the entrenchment view). On the other hand, good governance firms could also be more willing to make value-based equity grants because effective governance mechanisms can mitigate the anti-incentive effects of such grants (the optimal contracting view). Following the literature, we measure a firm's governance quality by various board characteristics and institutional ownership. We find a positive association between governance quality and the use of value-based equity grants in logistic regressions, which is inconsistent with the entrenchment view but in line with the optimal contracting view.

To address potential endogeneity concerns with governance, we use a dynamic panel generalized method of moments (GMM) model. The GMM model corrects the potential bias caused by the possible simultaneity between governance and a firm's pay-setting choices. Following Wintoki, Linck, and Netter (2012), we use high-order lagged variables in the GMM system (value-based practices, governance quality scores, and control variables), firm age, and year dummies as

[1]For example, Albuquerque et al. (2013) find that compensation peer choices are consistent with retention needs, but the authors do not study what motivates firms to adopt the benchmarking practice.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

instruments. We first run the GMM model in the full sample but find insignificant results. We also repeat the analysis in subsamples split by retention pressure as the optimal contracting view predicts a particularly strong effect of governance for firms facing high retention pressure. However, we continue to find insignificant results in all subsamples. Collectively, the GMM results suggest that both the entrenchment view and the optimal contracting view may have some bite in the determination of value-based equity grants.

Answering the call by Murphy (2013), this paper adds to a growing literature that investigates details of compensation-setting mechanisms. Examples of this literature include work on specific components of CEO contracts (e.g., Sundaram and Yermack (2007), Xu and Yang (2016)) and their contractual features (e.g., Denis (2012), Gopalan, Milbourn, Song, and Thakor (2014)). Our work is mostly related to Hall (1999) and Shue and Townsend (2017a). Hall examines option compensation mechanisms, and Shue and Townsend (2017a) focus on how a firm determines the number of shares granted to a CEO. We expand this literature in at least four ways. First, we show that the fixed-value plans discussed by Hall are not limited to options. Second, we point out that two popular pay-setting mechanisms – presetting pay structure and compensation benchmarking – also result in value-based equity grants. Third, we empirically document the impacts of value-based equity grants on ex post and ex ante CEO incentives and show that such practices lead to lower R&D investment growth. As such, our findings should help alert boards to the unintended consequences of pursuing a target pay level or structure. Finally, we formally investigate firms' economic motives to adopt these practices. We find that retention pressure is a key reason for the use of value-based equity pay. Corporate governance could also play a profound role.

Retention and incentives are the two main goals of executive compensation. In a recent survey, Edmans, Gosling, and Jenter (2022) find that boards and investors differ drastically in how they prioritize retention versus incentives in setting CEO compensation. Such a disagreement should not be a concern if these two goals can be achieved either independently or simultaneously. For example, in standard compensation models, the retention need is considered by a participation constraint that the CEO's expected utility is greater than or equal to a constant, which is independent of incentive design.[2] This paper, however, shows that pay practices motivated by retention pressure lead to suboptimal incentives. Thus, the disagreement about which goal is more important can create conflicts between boards and investors.

The remainder of this paper is organized as follows: Section II identifies three compensation-setting practices that lead to value-based equity grants. Section III examines the incentive implications of these practices. Section IV explores the real consequences of value-based practices, and Section V investigates the underlying economic motives. In Section VI, we conclude.

II. Three Pay Practices That Lead to Value-Based Equity Grants

In this section, we show that three pay-setting practices can lead to value-based equity grants: i) multi-year fixed-value plans, ii) presetting pay structure, and

[2]For example, see Holmstrom and Milgrom (1987), Oyer (2004), and Gabaix, and Landier (2008).

TABLE 1

Summary Statistics of Main Variables Used in This Study

Table 1 reports the summary statistics of the main variables used in this study. Please refer to Appendix A for their definitions. The sample includes all firms covered by the ExecuComp database from 2006 to 2022.

	N	Mean	SD	Median
Variables Indicating Value-Based Practices				
Fixed Value	28,136	0.227	0.419	0.000
Preset Structure	34,393	0.406	0.491	0.000
Pay Tracking	32,621	0.571	0.495	1.000
Value-Based Practice	34,393	0.703	0.457	1.000
Equity Pay Related Variables				
Ln No. of Granted Stock Shares	14,527	11.630	1.092	11.650
Ln No. of Granted Options	19,498	10.500	1.180	10.520
Ln Portfolio Delta	27,489	5.363	1.592	5.353
Change in R&D				
ΔR&D	30,474	0.0042	0.0223	0.0000
Control Variables				
Ln (MV)	32,330	14.650	1.698	14.570
Tobin Q	31,349	1.980	1.438	1.489
Ret Volatility	32,772	0.106	0.062	0.090
Ret before Option Grant	13,993	0.137	0.449	0.098
Ret before Stock Grant	18,460	0.148	0.463	0.096
Ln Cumulative Ret	32,123	0.580	1.102	0.460
Firm Age	34,263	26.240	18.330	22.000
CEO Age	31,926	56.380	7.142	56.000
CEO Tenure	34,030	7.151	7.165	5.000
CEO_First_Year	34,393	0.065	0.247	0.000
Inside_CEO	34,393	0.181	0.385	0.000
Ln (TDC1)	32,137	8.234	1.057	8.343
Equity Pay Ratio	32,046	0.520	0.368	0.536
Retention Pressure Related Variables				
Citation	34,393	8.873	8.690	6.000
Ln Network Size	29,315	6.861	1.216	7.025
CID NO	34,393	0.601	0.925	0.000
Size Percentile	32,525	50.460	28.820	50.640
Founder	34,393	0.073	0.261	0.000
Marketable Age	31,926	0.408	0.491	0.000
Business Uniqueness	31,207	0.500	0.500	1.000
Retention Pressure Score	25,019	3.943	1.313	4.000
Governance Quality Related Variables				
Board Indp. Ratio	30,968	0.806	0.108	0.833
Board Busy Ratio	30,968	0.459	0.245	0.455
Board Coopted Ratio	30,968	0.422	0.300	0.400
CEO Chair	34,393	0.361	0.480	0.000
Inst Block Ownership	34,393	0.224	0.165	0.228
Governance Quality Score	30,968	2.640	1.109	3.000

iii) strict pay tracking. To evaluate the prevalence and understand the consequences of these practices, we focus on the U.S. firms covered by the ExecuComp database from 2006 to 2022. The sample starts in 2006 because we need detailed information about compensation benchmarks to identify pay tracking, and this information becomes publicly available that year. Please refer to Table 1 for the summary statistics of our sample firms' characteristics.

A. Fixed-Value Plans

Hall (1999) and Shue and Townsend (2017b) show that in the 1990s, many firms adopted multi-year compensation contracts in which the dollar amount of annual option grants was set to be unchanged during a contract cycle (the fixed-value option plan). In addition to options, firms could also adopt a fixed-value stock plan or fixed-value total-equity plan. Appendix B provides three examples in which

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

the firms' proxy statements contain texts suggesting they are using fixed-value plans.

Unfortunately, companies do not often make clear statements about whether they fix equity pay values.[3] Therefore, we cannot use textual analysis to define fixed-value equity plans. We instead use the method of Shue and Townsend (2017b). Specifically, we define a firm as having a fixed-value option plan in year $t-1$ and t if the total dollar amount of the option grants reported in year t is within the range of 0.97 and 1.03 of that in year $t-1$.[4] To ensure we do not falsely classify a share-based plan as a value-based plan, we further require that the stock price change from year $t-1$ to year t exceeds +/−3%. We use the same criteria to identify firms that make fixed-value stock grants or fixed-value total equity grants.[5]

Figure 1 illustrates the prevalence of firms using fixed-value plans. At the beginning of the sample period (2006), among ExecuComp firms with available information for defining fixed-value plans, about 10.2% utilize the fixed-value approach in setting equity pay. By the end of 2022, about 23.2% of them do so. Among the three types of fixed-value equity grant practices, we find more and more firms make fixed-value stock grants. The relative presence of firms making fixed-value option grants, however, remains largely stable over time.

B. Presetting Pay Structure

When a compensation contract presets the pay structure – that is, when it prespecifies the relationship between the values of equity grants and total pay or between the values of stock and options – the dollar value of the equity grants must be predetermined (i.e., value based). Preset pay structure typically exhibits a regular proportion (such as 50–50 between stocks and options) or a fixed ratio that is unchanged over time. Such a relationship is almost impossible under a share-based grant because the stock and option prices constantly change, and the relationship between these two prices is irregular. We therefore use this insight to identify firms that preset the pay structure of their CEOs' compensation.

Specifically, we identify a firm as following a preset-structure plan if any of the following conditions is satisfied: The ratio of equity pay to total pay has a regular value such as equal to 5%×n (n = 1 to 19) or 1/3 or 2/3 (Case 1); for firms paying both options and stock, the ratio of stock-based pay (or option-based pay) to equity-based pay has a regular value as defined above, *or* the ratio between stock-based pay and option-based pay has a regular value as defined above (Case 2); or one of the ratios calculated above is the same as that of the previous year (within the 0.97–1.03 bandwidth) (Case 3).[6] Throughout this paper, we indicate these firms by the dummy

[3]We randomly drew 50 proxy statements from our sample of firms that use fixed-value plans based on our methods. Of them, only 10 contain texts suggesting a fixed-value plan.

[4]In a robustness check, we also narrow the range to (0.99, 1.01) to identify fixed-value plans or other value-based practices whenever appropriate. Our key results remain similar and can be found in the Supplementary Material.

[5]Shue and Townsend (2017b) allow a range of flexibility (0.97, 1.03) in defining fixed-value option plans due to a "round lots" issue. We also examine stock grants and find the issue to exist in stock grants as well.

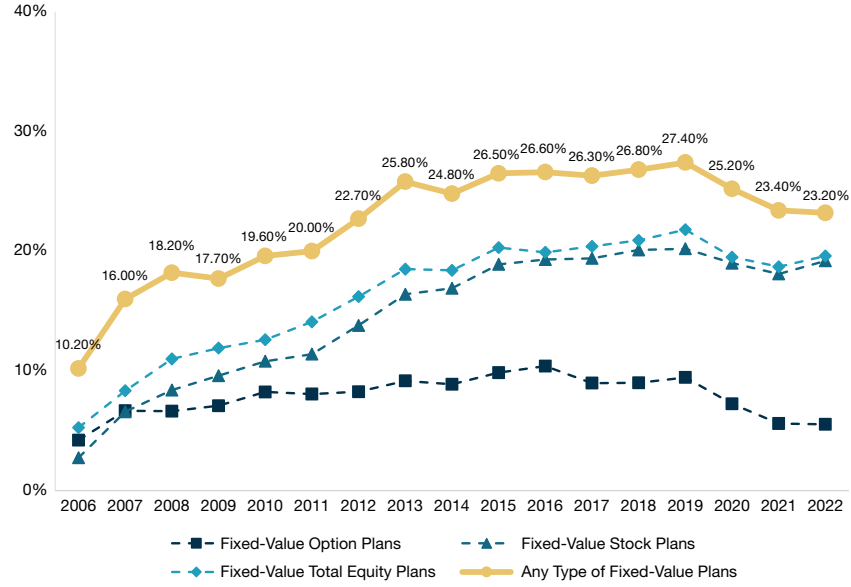
[6]Similarly as before, for Case 3, we require that the stock price change from the previous year exceeds +/−3% to ensure we do not falsely classify a share-based plan as a value-based plan.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

FIGURE 1

Percentage of Firms Using Fixed-Value Plans

Figure 1 illustrates the percentage of sample firms that utilize fixed-value option (stock, total equity) plans, and the percentage of firms that use any type of fixed-value plans each year during our sample period. A firm is said to use a fixed-value option/stock/total equity plan in setting CEO option/stock/total equity pay in both year $t-1$ and year t if the dollar amount of option/stock/total equity pay that the CEO receives in year t is within the 0.97–1.03 bandwidth of that in year $t-1$, and the stock price change from year $t-1$ to year t is more than +/−3%. The sample includes all firms covered by the ExecuComp database that have complete information for defining fixed-value plans from 2006 to 2022.



Preset Structure. Appendix B provides three examples in which the firms' proxy statements contain texts suggesting they preset CEO pay structure.[7]

Figure 2 shows that presetting pay structure is a popular practice. At the beginning of our sample period (2006), among all ExecuComp firms with available information for defining preset structure, about 32% preset their CEOs' compensation structure which leads to value-based equity grants. By the end of 2022, 41% of them do so. Figure 2 also shows that presetting the structure among equity pay components (Case 2) and fixing pay structure (Case 3) are more popular. The percentage of firms with fixed pay structure increases over time. Finally, the percentage of firms with a regular equity-to-total pay ratio (Case 1) remains stable over time.

C. Strict Pay Tracking

Finally, strict pay tracking, another widespread compensation-setting practice, can also result in value-based equity grants. Specifically, if a board's goal is to

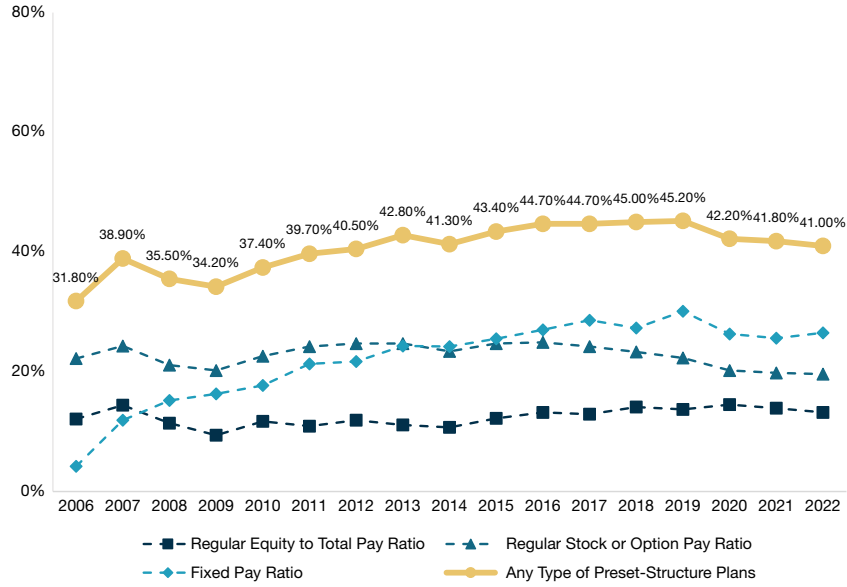
[7]Like for fixed-value plans, we do not rely on proxy statement to define preset structure, because most companies do not make clear statements about whether they preset pay structure. To show this, we randomly drew 50 proxy statements from our sample of firms that use preset-structure plans based on our methods. Of them, only 18 contain texts suggesting a preset structure.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

FIGURE 2

Percentage of Firms That Preset the Structure of CEO Compensation

Figure 2 illustrates the percentage of firms that preset the pay structure of CEO compensation. A firm is said to preset a pay structure if the ratio of equity to total pay is regular or unchanged, or any ratio among stock, option, and equity pay is regular or unchanged. Specifically, *Regular Equity to Total Pay Ratio* (Case 1) includes all cases in which the ratio of equity pay to total pay has a regular value such as equal to 5%×n (n = 1 to 19) or 1/3 or 2/3; *Regular Stock or Option Pay Ratio* (Case 2) includes all cases that have a regular ratio of stock (or option) pay to equity pay, or that have a regular ratio between stock and option pay. *Fixed Pay Ratio* (Case 3) includes all cases when one of the ratios calculated above remains the same as in the previous year (within the 0.97–1.03 bandwidth, and the stock price change from year $t-1$ to year t is more than +/−3%). The sample includes all firms covered by the ExecuComp database that have complete information for defining preset structure from 2006 to 2022.



closely track an external benchmark in determining the CEO's equity pay or total compensation, the value of the equity grant must be largely predetermined. Otherwise, strict tracking is impossible unless the firm's stock/option prices closely comove with the firm's benchmark peers' stock/option prices. This condition, however, is often unlikely.

To empirically determine whether a firm practices strict pay tracking, we need to infer the benchmark-implied pay. Following the literature (Bizjak, Lemmon, and Naveen (2008), Cremers and Grinstein (2013)), to measure a firm's benchmark total pay (or equity pay) for its CEO, we use the median CEO total compensation (or equity pay) of the companies from the same 2-digit SIC industry as the focal firm with comparable sales (that is, a sales level within the range of 50% to 150%). To minimize the measurement error, if a firm reports a specific peer group as its benchmark, we use the disclosed peer companies' median CEO total pay (or equity pay) as the benchmark-implied total pay (or equity pay). If the firm further discloses a specific percentile of peer CEO pay (such as the 75th percentile) as the target in forming the benchmark, we replace the median with the reported target percentile to compute their benchmark-implied pay.

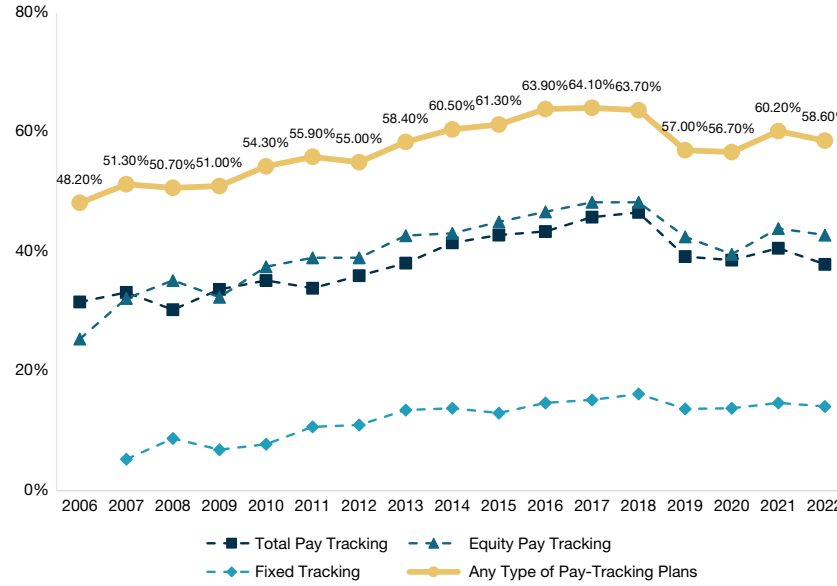
We then compare a CEO's reported total pay (or equity pay) to her benchmark-implied total pay (or equity pay). If the ratio of reported total pay

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

FIGURE 3

Percentage of Firms That Practice Strict Pay Tracking

Figure 3 illustrates the percentage of firms that practice strict pay tracking. A firm is said to practice strict pay tracking if the ratio of the total pay (equity pay) to the benchmark-implied total pay (equity pay) is between 0.75 and 1.25; or unchanged over time. Specifically, *Total Pay Tracking* includes all firms whose CEOs' total compensation closely tracks the benchmark-implied total pay. *Equity Pay Tracking* includes all firms whose CEOs' equity pay closely tracks the benchmark-implied equity pay. *Fixed Tracking* includes all firms if any of the above two tracking ratios does not change from the previous year (within the 0.97–1.03 bandwidth, and the stock price change from year $t-1$ to year t is more than +/−3%). Please refer to Appendix A for the methodology of constructing the benchmark-implied compensation. The sample includes all firms covered by the ExecuComp database that have complete information for defining strict pay tracking from 2006 to 2022.



to benchmark-implied total pay (or of reported equity pay to benchmark-implied equity pay) is between 0.75 and 1.25, we define the firm as practicing strict total pay tracking (or equity pay tracking). We select this bandwidth because most of the disclosed target percentiles of our sample lie between the 25th and 75th percentiles. Our results, however, remain robust if we use the narrower bandwidths of 0.8–1.2 and 0.9–1.1. Finally, we also define a firm as practicing strict pay tracking if either ratio (total pay-to-benchmark; equity pay-to-benchmark) remains unchanged from last year (within the 0.97–1.03 bandwidth) (fixed tracking).[8]

Figure 3 illustrates the prevalence of strict pay tracking among our sample firms. At the beginning of our sample period (2006), among ExecuComp firms with available information for defining strict pay tracking, about 48.2% practice strict pay tracking. By the end of 2022, 58.6% of them do so. Among three possible strict pay tracking, we find that strict equity pay tracking is the most popular, followed by strict total pay tracking, and then fixed tracking.[9]

[8]Similarly as before, we require that the stock price change from last year exceeds +/−3%. We further verify our method by examining a firm's benchmark-based pay-setting policies. Please refer to the Supplementary Material for more details.

[9]The Supplementary Material contains a plot illustrating the relative presence of value-based versus share-based practices.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

TABLE 2

Number of Firms Making Value-Based CEO Equity Grants

Table 2 reports the yearly number of firms that utilize one specific type (fixed-value plan, preset pay structure, or strict pay tracking) or any of the three types of value-based CEO equity-granting practices, and the number of firms that make share-based equity grants. Please refer to Appendix A for the detailed definition of each practice. The sample includes all firm-years covered by the ExecuComp database that have information to define these practices from 2006 to 2022.

	Value-Based Practice					
Year	Fixed Value	Preset Structure	Pay Tracking	Any Value-Based Practice	Share-Based Practice	Total
2006	126	539	758	1015	680	1,695
2007	192	773	962	1306	681	1,987
2008	291	803	1,077	1437	823	2,260
2009	318	764	1,085	1,453	782	2,235
2010	347	833	1,153	1,480	746	2,226
2011	355	875	1,172	1,503	699	2,202
2012	403	884	1,144	1,486	695	2,181
2013	456	926	1,216	1,560	604	2,164
2014	450	900	1,276	1,558	623	2,181
2015	473	912	1,243	1,568	533	2,101
2016	467	911	1,253	1,542	494	2,036
2017	457	875	1,209	1,484	472	1,956
2018	447	866	1,183	1,477	447	1,924
2019	452	843	988	1,383	481	1,864
2020	406	769	960	1,324	498	1,822
2021	372	751	989	1,339	456	1,795
2022	373	723	954	1,280	484	1,764
Total	6,385	13,947	18,622	24,195	10,198	34,393

D. Further Discussion

Table 2 further reports the number of sample firms that utilize any type of value-based practices from 2006 to 2022. Overall, we have 6,385 firm-years using fixed-value plans, 13,947 using preset-structure plans, and 18,622 using strict pay tracking. The total number of firm-years using any value-based equity-granting practice is 24,195. On the other hand, the total number of firm-years using any share-based practice is 10,198.

Our empirical analyses compare value-based practices with share-based practice. When a specific value-based practice (e.g., fixed-value plan) is examined, we only include firm-years with that value-based practice and firm-years with share-based practice. For example, to investigate the effect of fixed-value practice on incentives, the sample only includes fixed-value and share-based firm-years that have complete data for analysis. This strategy is necessary to ensure such a test is comparing that value-based practice with share-based practice, not with the collection of share-based practice and other value-based practices.

III. The Incentive Impacts of Value-Based Equity Grants

Compared with share-based practices, value-based equity-granting practices can generate two distinct incentive-weakening effects. Section III.A shows that value-based practices can weaken the connection between the most recent stock performance and the level of equity pay (the ex post pay-performance sensitivity). Section III.B shows that they can weaken a CEO's ex ante incentives to work for shareholders (portfolio delta).

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

A. Effect on CEOs' Ex Post Pay-Performance Sensitivities

Value-based practices can weaken the ex post pay-performance sensitivity, resulting in a pay-without-performance effect. This is because under a value-based practice, a CEO's equity pay can be determined by factors not directly related to the firm's most recent performance. For example, if the contract is a multi-year fixed-value plan, the CEO will receive the same amount of equity regardless of the most recent stock performance. Similarly, under strict pay tracking, the CEO's equity pay is mostly determined by benchmark peers' equity pay, which does not always closely correlate with the firm's performance. Because preset pay structure can only be achieved when equity value is predetermined, it may also weaken the connection between past stock performance and equity pay.

We use the model of Murphy (1985) and Bertrand and Mullainathan (2001) to show this anti-incentive effect:

$$\begin{aligned}(1)\quad Ln\ Equity\ Pay_{i,t} = {} & \beta_0 + \beta_1 Ln(MV)_{i,t-1} + \beta_2 Ln(MV)_{i,t-1} \\ & \times Value\text{-}Based\ Practice_{i,t} + \beta_3 Value\text{-}Based\ Practice_{i,t} \\ & + \gamma Controls_{i,t-1} + \alpha_i + \mu_t + \varepsilon_{i,t}\end{aligned}$$

The dependent variable, $Ln\ Equity\ Pay_{i,t}$, is the natural logarithm of the equity pay (in thousands of dollars) of a CEO in a given fiscal year. The independent variable $Ln\ (MV)_{i,t-1}$ is the natural logarithm of lagged firm value. Since the regressions control for firm-fixed effects, the coefficient β_1 measures the ex post pay-performance sensitivity (ex post PPS) for firms using share-based practices. The key variable of interest is the interaction $Ln\ (MV)_{i,t-1} \times Value\text{-}Based\ Practice_{i,t}$, where *Value-Based Practice* equals 1 if a firm uses any type of value-based practices in granting equity (0 otherwise). As such, β_2 captures the possible PPS-weakening effect of value-based practices.

We control for firm growth opportunities (*Tobin Q*), return volatility, and various governance-related variables (including the ratio of independent board directors, the ratio of busy directors, the ratio of co-opted directors, a dummy indicating whether the CEO is also the board chair, and block institutional ownership). We additionally control for CEO turnover and a dummy for inside CEOs to account for different incentives of a new CEO and differences between inside and outside CEOs. We also control for year- and firm-fixed effects. The firm-fixed effect ensures that the results are driven by the within-firm variations in firm value and equity grants. The year-fixed effects control for macroeconomic factors. Throughout the paper, we use robust standard errors clustered at the firm level for statistical inferences to control for serial correlations in the data.

Table 3 reports the results. As expected, log firm value is significantly and positively associated with log equity pay. However, the estimated coefficient on the interaction term, $Ln\ (MV)_{i,t-1} \times Value\text{-}Based\ Practice_{i,t}$, is significantly negative, suggesting that compared with share-based firm-years, the ex post equity PPS is significantly weaker for value-based firm-years. This is true when we consider any type of value-based practices (column 1), as well as when we examine each specific

TABLE 3

Value-Based Equity Grants and the Ex Post Pay-Performance Sensitivity

Table 3 shows that value-based practices can weaken the ex post equity pay–stock performance relationship. The dependent variable is *Ln (Equity Pay)*. The key independent variable, *Value-Based Practice*, equals 1 if a firm uses any value-based practice (column 1), a fixed-value plan (column 2), a preset pay structure plan (column 3), or a strict pay tracking practice (column 4); and equals 0 if the firm uses a share-based plan. *Ln (MV)* is the logarithmic lagged market value of a firm. The sample includes firms in ExecuComp with information for analysis from 2006 to 2022. In each model, only firm-years using the particular form of value-based practice and those using a share-based practice are included. Please refer to Appendix A for the definitions of the control variables. All variables are winsorized at the 1st and 99th percentiles. *t*-statistics, reported in parentheses, are based on the robust standard errors clustered at the firm level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Ln (Equity Pay)			
Value-Based Practice =	Any Value-Based Versus Share-Based	Fixed Value Versus Share-Based	Preset Structure Versus Share-Based	Pay Tracking Versus Share-Based
	1	2	3	4
Ln (MV) × Value-Based Practice	**−0.0630*** (−6.65)**	**−0.0863*** (−6.79)**	**−0.0760*** (−7.24)**	**−0.0699*** (−6.85)**
Ln (MV)	0.4056*** (23.13)	0.4073*** (16.52)	0.4090*** (19.75)	0.4112*** (24.14)
Value-Based Practice	1.0079*** (7.20)	1.3327*** (6.88)	1.2627*** (8.08)	1.0760*** (7.11)
Tobin Q	−0.0244*** (−2.83)	−0.0264** (−2.07)	−0.0204** (−2.19)	−0.0236** (−2.53)
Ret Volatility	0.2161 (1.59)	0.2518 (1.10)	0.2216 (1.29)	0.2166 (1.48)
Board Indp. Ratio	0.5909*** (5.31)	0.5946*** (3.19)	0.7736*** (5.57)	0.5735*** (5.02)
Board Busy Ratio	0.1688*** (3.71)	0.1393* (1.93)	0.1971*** (3.68)	0.1499*** (3.26)
Board Coopted Ratio	0.1269*** (4.50)	0.1424*** (2.99)	0.1374*** (4.01)	0.1292*** (4.42)
CEO Chair	−0.0084 (−0.47)	0.0005 (0.02)	−0.0125 (−0.58)	−0.0268 (−1.46)
Inst Block Ownership	0.1471*** (2.62)	0.1729* (1.85)	0.1421** (2.01)	0.1261** (2.14)
CEO_First_Year	0.0499** (2.26)	0.0278 (0.62)	0.0336 (1.21)	0.0259 (1.09)
Inside_CEO	−0.0071 (−0.26)	−0.0476 (−1.03)	−0.0214 (−0.67)	0.0026 (0.09)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	25,907	9,667	17,452	20,634
Adjusted R^2	0.763	0.793	0.757	0.767

practice (columns 2–4).[10] On average, when all three practices are considered together, value-based equity grants are associated with a 15.5% lower PPS (−0.0630/0.4056 in column 1). Each individual practice is associated with a 17.0% (−0.0699/0.4112 in column 4) to 21.2% (−0.0863/0.4073 in column 2) lower PPS.

[10]Note that, because each regression compares a specific form of value-based practice with share-based practice and because the number of firm-years with each specific value-based practice varies, the number of observations varies across columns 2–4 and is smaller than that in column 1. The data availability about our key and control variables also contributes to the sample size variation.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

B. Effect on CEOs' Ex Ante Incentives

In addition to weakening the ex post pay-performance sensitivity, value-based equity grants can affect a CEO's ex ante incentives (i.e., ex ante PPS). This section shows this effect in 2 steps. Section III.B.1 empirically confirms that under value-based practices, better stock performance before the grant day leads to the CEO receiving fewer shares of stock or options on grant day (the periodic mechanical effect, as discussed at the beginning of this paper). Section III.B.2 shows that this periodic effect can accumulate and manifest as a weakened CEO portfolio delta.

1. The Periodic Effect on the Number of Options or Shares Granted

Unlike a share-based grant, a value-based grant intrinsically implies a negative relationship between pre-grant stock performance and the number of options and shares a CEO receives on the grant day. To verify this periodic anti-incentive effect, we introduce the following regression model:

$$\begin{aligned}(2)\quad Ln\,No.\,of\ Granted\ Shares_{i,t} = {} & \beta_0 + \beta_1\, Ret\ before\ Grant_{i,t} \\ & + \beta_2 Ret\ before\ Grant_{i,t} \times Value\text{-}Based \\ & \quad Practice_{i,t} + \beta_3\, Value\text{-}Based \\ & \quad Practice_{i,t} + \gamma Controls_{i,t-1} \\ & + \alpha_i + \mu_t + \varepsilon_{i,t}\end{aligned}$$

The dependent variable, *Ln No. of Granted Shares*, is the natural logarithm of the number of shares of stock or options granted in thousands in a given fiscal year. The independent variable, *Ret before Grant*, is the yearly stock return up to the stock/option grant day.[11] Its interaction with the dummy *Value-Based Practice* intends to capture the periodic anti-incentive effect of the value-based equity grant. Because we need the grant date to construct the return before a stock or option grant, this analysis excludes firm-years with no option or stock grants and those that lack the grant details such as grant dates and quantities.[12] The regressions include the same set of control variables as in the previous analysis, as well as the year- and firm-fixed effects.

Table 4 reports the results. Panel A focuses on the option grants. The sample includes only firm-years granting options to their CEOs. The dependent variable is *Ln No. of Granted Options.* Column 1 shows that the estimated coefficient of *Ret before Option Grant*×*Value-Based Practice* is −0.1414 (*t*-stat. = −3.09). That is, ceteris paribus, compared with share-based grants, value-based grants result in fewer options when stock performance is higher. Columns 2–4 of Panel A further examine whether this anti-incentive effect can be observed for each specific value-based practice. Column 2 looks into the fixed-value plans. The dummy *Fixed Value* equals 1 if a firm uses a fixed-value option plan and 0 if it does not use any value-based practice. We find that the estimated coefficient of *Ret before Option Grant*×*Fixed Value* is −0.3085 (*t*-stat. = −5.60), confirming that a fixed-value option

[11] About 10% of our sample firms grant stock or options more than once in a given fiscal year. For these cases, we follow Shue and Townsend (2017a) and use the day of the largest grant (in terms of the number of shares).

[12] In our sample, about 42.2% (56.7%) of the firm-years offer option (stock) grants to their CEOs and have detailed information on the quantities and dates of the option (stock) grants.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

TABLE 4

Value-Based CEO Equity Grants and No. of Shares Granted

Table 4 shows that value-based practices result in an inverse relationship between pre-grant stock performance and the quantity of equity grants that a CEO receives on grant day. Panel A focuses on option grants. The dependent variable is *Ln No. of Granted Options* (in thousands). The independent variable *Ret Before Option Grant* is the annual stock return before the option grant day. The independent variable, *Value-Based Practice*, equals 1 if a firm uses any type of value-based practices (column 1), a fixed-value plan (column 2), a preset-structure plan (column 3), or a pay-tracking practice (column 4); and equals 0 if the firm uses a share-based plan. Panel B repeats the same analysis for stock grants. The dependent variable is *Ln No. of Granted Stock Shares* (in thousands). The independent variable *Ret Before Stock Grant* is the annual stock return before the stock grant day. The sample includes firms in ExecuComp with information for analysis from 2006 to 2022. In each model, only firm-years using the particular form of value-based practice and those using a share-based practice are included. In Panel A, only firm-years that grant options to their CEOs are considered. In Panel B, only firm-years that grant stock are considered. Both panels include the same controls as in Table 3. Please refer to Appendix A for the definitions of the control variables. All variables are winsorized at the 1st and 99th percentiles. *t*-statistics, reported in parentheses, are based on the robust standard errors clustered at the firm level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Option Grants

	Dependent Variable: Ln No. of Granted Options			
Value-Based Practice =	Any Value-Based Versus Share-Based	Fixed Value Versus Share-Based	Preset Structure Versus Share-Based	Pay Tracking Versus Share-Based
	1	2	3	4
Ret before Option Grant×Value-Based Practice	**−0.1414*** (−3.09)**	**−0.3085*** (−5.60)**	**−0.1376*** (−2.88)**	**−0.1865*** (−4.01)**
Ret before Option Grant	−0.0375 (−0.84)	−0.0293 (−0.60)	−0.0566 (−1.21)	−0.0119 (−0.27)
Value-Based Practice	−0.0575** (−2.25)	−0.0245 (−0.51)	−0.0739** (−2.53)	−0.0248 (−0.90)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	12,371	2,715	9,915	9,439
Adjusted R^2	0.711	0.799	0.710	0.722

Panel B. Stock Grants

	Dependent Variable: Ln No. of Granted Stock Shares			
Value-Based Practice =	Any Value-Based Versus Share-Based	Fixed Value Versus Share-Based	Preset Structure Versus Share-Based	Pay Tracking Versus Share-Based
	1	2	3	4
Ret before Stock Grant×Value-Based Practice	**−0.1057*** (−2.83)**	**−0.1556*** (−2.89)**	**−0.0885** (−2.14)**	**−0.1424*** (−3.62)**
Ret before Stock Grant	−0.0766** (−2.21)	−0.1009** (−2.18)	−0.0861** (−2.39)	−0.0589 (−1.60)
Value-Based Practice	−0.0369* (−1.69)	−0.0254 (−0.75)	−0.0542** (−2.13)	−0.0301 (−1.28)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	16,253	4,571	11,100	12,682
Adjusted R^2	0.674	0.719	0.661	0.686

plan can lead to fewer options if the stock performs well. Column 3 looks into the practice of presetting pay structure. The estimated coefficient of *Ret before Option Grant×Preset Structure* is −0.1376 (*t*-stat. = −2.88), confirming that presetting equity pay structure can also lead to fewer options if the stock performs well. Finally, in column 4, we observe a similar effect for strict pay tracking: The

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

estimated coefficient of *Ret before Option Grant* ×*Pay Tracking* is −0.1865 (*t*-stat. = −4.01).

Panel B of Table 4 focuses on the stock grants. The sample includes only firm-years granting stocks to their CEOs. The dependent variable is *Ln No. of Granted Stock Shares.* We find a similar anti-incentive effect involving stock grants. For example, column 1 shows that the estimated coefficient of *Ret before Stock Grant*×*Value-Based Practice* is −0.1057 (*t*-stat. = −2.83). That is, if the stock performs well, a CEO under a value-based plan receives fewer shares than a CEO under a share-based plan. Columns 2–4 confirm this anti-incentive effect for each type of value-based practice. Overall, Table 4 identifies a fundamental issue with value-based practices: Better stock performance before the grant day causes the CEO to receive fewer shares of equity on the grant day.

2. Effect on Portfolio Delta

If a firm persistently makes value-based equity grants, the inverse relationship between pre-grant stock performance and the number of shares granted each year can lead to a negative relationship between a CEO's cumulative performance and her portfolio delta, a key metric to measure the strength of a CEO's overall ex ante incentives. In practice, this can result in a lower delta for CEOs constantly receiving value-based equity grants.

Consider a simple case in which a CEO takes office at year 0 and receives all her equity pay in common stock. Her portfolio delta in year T = $TN \times (1\% \times P_T)$, where *TN* denotes the total number of shares she has received over T years since becoming the CEO, and where P_T is the stock price at the end of year T. Each year a higher stock price leads to fewer shares being granted and vice versa. Under *persistent* value-based equity grants, higher cumulative stock returns will lead to a lower portfolio delta. As such, the periodic anti-incentive effect will result in a weakened (i.e., less positive) relationship between the cumulative stock performance of a CEO since her inauguration and her portfolio delta.[13]

To identify this cumulative effect, we introduce the following OLS regression model:

$$\begin{aligned}(3)\quad Ln\ Portfolio\ Delta_{i,t} = {} & \beta_0 + \beta_1\, Persistent\ Value\text{-}Based\ Practice_{i,t} \\ & \times Ln\ Cumulative\ Ret_{i,t} + \beta_2 Persistent\ Value\text{-}Based \\ & Practice_{i,t} + \beta_3\, Ln\ Cumulative\ Ret_{i,t} \\ & + \gamma\, Controls_{i,t-1} + \alpha_j + \mu_t + \varepsilon_{i,t}\end{aligned}.$$

The dependent variable is the natural logarithmic value of a CEO's portfolio delta. We follow the method of Core and Guay (2002) to construct this variable. The

[13]Value-based practices also imply that worse stock performance can generate more equity grants in quantity and possibly lead to a higher portfolio delta. However, this effect is unlikely in reality because of at least two mechanisms. First, equity grants could be performance-vested. Poor performance will result in less vested equity, invalidating the effect of negative performance on granted shares. Second, persistently poorly performing CEOs are more likely to be terminated. Our empirical results below confirm this intuition and show that, on average, portfolio delta is lower at firms with persistent value-based practices.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

independent variable, *Persistent Value-Based Practice*, is defined using value-based practices over the past 2, 3, or 4 consecutive years including year *t*. *Ln Cumulative Ret* is the logarithmic gross cumulative stock return of a firm up to year *t*, starting from the CEO's inauguration month. The interaction term, *Persistent Value-Based Practice×Ln Cumulative Ret*, captures the value-based equity grants' weakening effect on a CEO's ex ante incentives. Core and Guay (2002) note that firm characteristics such as firm size, growth potential, and stock return volatility also affect a CEO's wealth-performance sensitivity. We thus directly control for these variables in this analysis. In addition, we control for *CEO Tenure* and governance-related variables. We also control for CEO turnover and a dummy for inside CEOs to account for different incentives of a new CEO and differences between inside and outside CEOs. Since both persistent value-based practice and cumulative return have little variation over time, this analysis only controls for industry- and year-fixed effects.

Table 5 reports the results. In column 1, *Persistent Value-Based Practice* equals 1 in year *t* if a firm uses any value-based practice in both year *t* and year $t-1$, and 0 otherwise. Consistent with our prediction, column 1 shows a negative relationship between *Persistent Value-Based Practice×Ln Cumulative Ret* and CEO portfolio delta. The estimated coefficient of the interaction term is -0.0570 (t-stat. $= -2.27$). In column 2, *Persistent Value-Based Practice* equals 1 in year *t* if a firm uses any value-based practice in years *t*, $t-1$, and $t-2$, and 0 otherwise. The estimated coefficient of the interaction term is -0.0751 (t-stat. $= -2.81$). In column 3, *Persistent Value-Based Practice* equals 1 in year *t* if a firm uses any value-based practice in years *t*, $t-1$, $t-2$, and $t-3$, and 0 otherwise. The estimated coefficient of the interaction term is -0.1023 (t-stat. $= -3.60$). Overall, these results clearly show that the anti-incentive effect of the value-based practices strengthens both statistically and in economic magnitudes when such practices are used more persistently. The effect is sizable. Take the result of column 3 as an example. The results suggest that persistent value-based equity grants lower a CEO's wealth-performance sensitivity by about 32% ($= -0.1023/0.3183$).

The results in Table 5 also imply that a CEO at an average firm that is persistently using value-based practices has a lower portfolio delta. This can be seen by multiplying the coefficient on the interaction term *Persistent Value-Based Practice× Ln Cumulative Ret* by the average value of *Ln Cumulative Ret* and then adding the coefficient on *Persistent Value-Based Practice.* Take the result of column 3 as an example. The average effect of persistent value-based practice is about -0.057 ($= -0.1023\times 0.58 + 0.0021$). Hence, firms that use value-based practices persistently offer CEO equity incentives that are 5.7% percentage points lower than other firms. These results suggest a nontrivial problem for corporate boards that rely on equity holdings to motivate skilled CEOs.

Overall, Section III shows that paying equity with a preset dollar amount/structure can weaken ex post and ex ante CEO incentives. These results highlight an often-neglected drawback to pursuing a target (either regular or fixed) structure or level of CEO compensation. In the next section, we will explore value-based equity grants' real consequences on corporate policies.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

TABLE 5

Value-Based Equity Grants and CEO Portfolio Delta

Table 5 examines the impact of value-based equity grants on CEO portfolio delta. *Ln Portfolio Delta* is the natural logarithmic value of a CEO's portfolio delta (that is, the change in the thousand-dollar value of the CEO's total portfolio of stock and options for a 1% change in the stock price of the firm). We follow the method of Core and Guay (2002) to calculate each CEO's portfolio delta. In column 1, the key independent variable, *Persistent Value-Based Practice*, equals 1 in year *t* if a firm makes value-based equity grants in years *t* and *t*−1, and 0 otherwise. In column 2, *Persistent Value-Based Practice* equals 1 in year *t* if a firm makes value-based equity grants in years *t*, *t*−1, and *t*−2, and 0 otherwise. In column 3, *Persistent Value-Based Practice* equals 1 in year *t* if a firm makes value-based equity grants in years *t*, *t*−1, *t*−2, *t*−3, and 0 otherwise. *Ln Cumulative Ret* is the logarithmic gross cumulative return of a firm's stock since the CEO took office. The sample includes all firms in ExecuComp that have information for analysis from 2006 to 2022. Please refer to Appendix A for the definitions of the control variables. All variables are winsorized at the 1st and 99th percentiles. *t*-statistics, reported in parentheses, are based on the robust standard errors clustered at the firm level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Ln Portfolio Delta		
	1	2	3
Persistent Value-Based Practice× Ln Cumulative Ret	**−0.0570****	**−0.0751*****	**−0.1023*****
	(−2.27)	**(−2.81)**	**(−3.60)**
Persistent Value-Based Practice	0.0011***	0.0015***	0.0021***
	(3.61)	(4.35)	(5.30)
Ln Cumulative Ret	0.3243***	0.3185***	0.3183***
	(12.38)	(12.17)	(12.11)
CEO Tenure	0.0415***	0.0419***	0.0422***
	(11.19)	(10.84)	(10.54)
Ln (MV)	0.4851***	0.4853***	0.4849***
	(35.01)	(33.88)	(32.84)
Tobin Q	0.0554***	0.0595***	0.0601***
	(4.24)	(4.48)	(4.32)
Ret Volatility	0.0844	0.0849	0.1696
	(0.35)	(0.34)	(0.64)
Board Indp. Ratio	−0.5759***	−0.6456***	−0.6565***
	(−3.10)	(−3.26)	(−3.14)
Board Busy Ratio	0.3109***	0.2993***	0.2800***
	(4.12)	(3.83)	(3.45)
Board Coopted Ratio	0.6310***	0.6490***	0.6738***
	(10.25)	(10.06)	(9.97)
CEO Chair	0.2136***	0.2073***	0.2015***
	(5.92)	(5.54)	(5.13)
Inst Block Ownership	−0.2849***	−0.2961***	−0.3427***
	(−2.89)	(−2.80)	(−3.03)
CEO_First_Year	−0.4024***	−0.4124***	−0.4158***
	(−11.29)	(−10.63)	(−10.22)
Inside_CEO	−0.0015	−0.0009	−0.0017
	(−0.03)	(−0.02)	(−0.03)
Year FE	Yes	Yes	Yes
Ind FE	Yes	Yes	Yes
Observations	20,299	17,344	15,156
Adjusted R^2	0.600	0.601	0.603

IV. Exploring the Real Consequences of Value-Based Equity Grants

Value-based equity grants result in weakened incentives, both ex post and ex ante. As a result, ceteris paribus, CEOs under value-based equity grants might not work as hard on value-enhancing investments as CEOs under share-based equity grants. Following Edmans, Fang, and Lewellen (2017), we focus on firms' R&D investments to test this hypothesis. We hypothesize that CEOs under value-based equity grants could slow their investments in R&D. To address the concern that a

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

firm's use of a value-based plan and a firm's investment decisions are endogenous, we introduce two identification strategies, which are discussed below.

A. Identification Strategy 1: Exploiting the Repeating Tendency of Fixed-Value Plans

Our first empirical strategy focuses on multi-year fixed-value plans as an example of value-based practice. To address endogeneity, we exploit the fact that firms on fixed-value plans tend to use repeated cycles of equal length (Shue and Townsend (2017b)). Specifically, we introduce a dummy variable, *Extrapolated Fixed Value*, that equals 1 for 3 (2) years if the previous 3 (2) years are a completed cycle of a multi-year fixed-value contract, and 0 otherwise. *Extrapolated Fixed Value* is correlated with the occurrence of an actual fixed-value plan because of firms' tendency to repeat a previous fixed-value cycle. As such, it is not influenced by the endogenous renegotiations of the contract between the CEO and the board which could also affect a CEO's investment policies. In other words, *Extrapolated Fixed Value* is an instrumental variable that helps isolate variations in the timing of fixed-value contracts that are likely predetermined and thus exogenous.

We estimate the effect of value-based equity practice on R&D investment using both an OLS model and a 2-stage least squares (2SLS) regression model. Following Edmans et al. (2017) and Shue and Townsend (2017b), we use the annual change in sales-scaled R&D investment from last year (ΔR&D) to measure R&D investment which is the dependent variable.[14] We control for firm size, growth potential, and risk level. In addition, to account for the effect of the pay level or pay structure on a firm's investment decision, we also include, as controls, the total pay level and the actual equity-to-total pay ratio of the CEO. This ensures that our results reflect the effect of the equity-pay-setting mechanism (value-based vs. share-based), instead of the pay level itself. We additionally control for CEO turnover, inside CEOs, CEO age, and firm age (Edmans et al. (2017)). Since the dependent variable is a within-firm first difference, we do not control for firm-fixed effects. We do still include year- and industry-fixed effects.

Table 6 reports the results. The sample includes firm-years that use fixed-value plans and those that do not use any value-based practice. For comparison, in column 1, we do not address the endogeneity problem. The key independent variable is a dummy, *Fixed Value*, that equals 1 if a firm uses a multi-year fixed-value plan, and 0 if it does not use any value-based practices. Under this OLS regression, we find that firms with fixed-value contracts are associated with slower R&D investment (t-stat. = −2.63). In column 2, we report the first-stage results of the 2SLS regressions. We find that *Extrapolated Fixed Value* has a significantly positive relation with firms' use of fixed-value plans. The F-statistic for the test of the null hypothesis (that the instrument has a 0 coefficient) is roughly 138.5 (square of the t-stat. of 11.77), suggesting that this is a strong

[14]Following the literature, we treat missing ΔR&D as 0 and indicate this treatment with the dummy *R&D_Missing* in this analysis.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

TABLE 6

Exploring the Real Consequence of Value-Based Equity Grants: Evidence Based on Fixed-Value Plans

Table 6 explores the impact of fixed-value plans on a firm's R&D growth. Column 1 presents the OLS regression analysis. The dependent variable is the annual growth in R&D investment. The key independent variable *Fixed Value* equals 1 if a firm adopts a fixed-value plan and 0 if it uses a share-based plan. Columns 2–3 report the results of the 2SLS regression analysis. The instrumental variable *Extrapolated Fixed Value* equals 1 for 3 (2) years following a completed cycle of a 3-year (2-year) fixed-value contract, and 0 otherwise. The first-stage regression (column 2) generates the instrumented value of *Fixed Value* for use in the second-stage regression (column 3). The sample includes firm-years using fixed-value plans and those using share-based plans over the period of 2006–2022. Please refer to Appendix A for the definitions of the control variables. All variables are winsorized at the 1st and 99th percentiles. *t*-statistics, reported in parentheses, are based on the robust standard errors clustered at the firm level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable		
	OLS	2SLS	
	ΔR&D	First-Stage: Fixed-Value	Second-Stage: ΔR&D
	1	2	3
Fixed Value	**−0.0011*** (−2.63)**		
Extrapolated Fixed Value		**0.1496*** (11.77)**	
Instrumented Fixed Value			**−0.0088*** (−3.58)**
Ln (TDC1)	−0.0006 (−1.54)	0.0378*** (4.12)	−0.0003 (−0.79)
Equity Pay Ratio	0.0044*** (4.16)	−0.0082 (−0.51)	0.0043*** (4.05)
Ln (MV)	0.0002 (0.82)	0.0489*** (8.07)	0.0006** (2.04)
Tobin Q	0.0035*** (9.10)	−0.0201*** (−4.29)	0.0033*** (8.73)
Ret Volatility	0.0191*** (3.63)	−0.9192*** (−9.52)	0.0118** (2.15)
Firm Age	−0.0001*** (−6.02)	0.0018*** (4.68)	−0.0001*** (−4.73)
CEO Age	0.0000 (0.09)	−0.0026*** (−3.18)	−0.0000 (−0.39)
CEO_First_Year	−0.0002 (−0.18)	−0.2182*** (−11.28)	−0.0019 (−1.52)
Inside_CEO	−0.0011** (−2.21)	0.0212 (1.34)	−0.0009* (−1.70)
R&D Missing	−0.0071*** (−8.58)	−0.0075 (−0.36)	−0.0071*** (−8.57)
Year FE	Yes	Yes	Yes
Ind FE	Yes	Yes	Yes
Observations	11,681	11,681	11,681
Adjusted R^2	0.140	0.169	0.115

instrument (Stock and Yogo (2005)). Column 3 reports the second-stage regression results. We find that the OLS finding continues to hold when endogeneity is accounted for. The estimated coefficient on the instrumented *Fixed Value* is −0.0088 (*t*-stat. = −3.58), indicating that a fixed-value contract results in a 0.88 percentage points decline in ΔR&D. The economic magnitude of this effect is meaningful as it equals 2.1 times of the mean (=0.0088/0.0042) and almost 40% of standard deviation (0.0223) of ΔR&D.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

B. Identification Strategy 2: Exploiting the Mandatory Vote on Say-on-Pay Frequency

Our second identification strategy focuses on another type of value-based equity grant: presetting pay structure. We rely on the mandatory votes on the frequency of say-on-pay for identification. Under the Dodd–Frank Act, the SEC has required, since early 2011, that almost all public firms hold advisory votes on executive compensation (say-on-pay or SOP votes). However, the shareholders must also vote on how often the SOP votes should occur: Once per year, once per 2 years, or once per 3 years.

We posit that the voting outcome on SOP frequency can affect a board's likelihood of presetting pay structure, with a vote for more frequent SOP making a preset pay structure more appealing to the board. We propose two reasons for this connection. First, a recent survey by Edmans et al. (2022) finds that institutional investors – the most important proxy voting participants – tend to focus on the incentive design when reviewing an executive's compensation contract. The pay structure between cash and equity pay, or between option and stock grants, is one of the most salient and intuitive incentive metrics. Second, because the price movements of stocks and options are highly volatile and unpredictable, the reported pay structure can be everchanging under a share-based plan. For example, the ratio between the cash and equity pay could be 23–77 in year $t-1$ but 42–58 in year t (if the stock price goes down in year t), even though the number of shares granted does not decrease. Results such as these are particularly confusing to shareholders who review the CEO compensation annually (that is, if the SOP frequency is yearly).[15] To mitigate such confusion and avoid the burden of a lengthy explanation in shareholder meetings, a board could instead choose to preset pay structure.

As such, a vote for an annual SOP could be an exogenous shock to a board's likelihood of presetting pay structure. On the other hand, there is no clear reason to expect that this vote, which has nothing to do with the actual pay level or specific pay structure, can directly affect a CEO's real decision-making.

Therefore, we use a new variable, *One-Year SOP*, as our instrumental variable to identify the real effect of value-based practice on a firm's R&D investment. This variable equals the fractional vote for the once-a-year SOP frequency. Because the first mandatory voting event occurs in 2011, the sample in this analysis only includes firms with complete information from 2011 to 2022. Most firms have 2 frequency votes during our sample period as the SEC mandates SOP frequency votes to occur at least once every 6 years.[16]

Table 7 reports the results. Column 1 reports the results of the OLS regression analysis. The key independent variable, *Preset Structure*, equals 1 if a firm presets the pay structure of the CEO compensation and 0 if the firm uses a share-based practice. We control for CEO pay level and structure as well as other CEO and firm characteristics as in Table 6. Consistent with our prediction, the estimated

[15]Furthermore, under the share-based equity grant plan, the price-dependent pay structure will also make it difficult for the investors to compare one firm's pay structure with other firms.

[16]"Investor Bulletin: Say-on-Pay and Golden Parachute Votes," SEC Office of Investor Education and Advocacy, Mar. 2011.

TABLE 7

Exploring the Real Consequence of Value-Based Equity Grants: Evidence Based on Preset Pay Structure Plans

Table 7 explores the impact of preset pay structure on a firm's R&D growth. Column 1 presents the OLS regression results. The dependent variable is the annual growth in R&D investment. The key independent variable *Preset Structure* equals 1 if a firm-year presets pay structure of CEO compensation and 0 if it uses a share-based plan. Columns 2–3 report the results of the 2SLS regression analysis. The instrumental variable, *One-Year SOP* is the most recent fractional vote for the once-a-year frequency of say-on-pay. The first-stage regression (column 2) generates the instrumented value of *Preset Structure* for use in the second-stage regression (column 3). Because this variable becomes available since 2011, the sample only includes firm-years in ExecuComp that have complete information for analysis from 2011 to 2022. Only firm-years that preset pay structure and those that use share-based plans are considered. Please refer to Appendix A for the definitions of the control variables. All variables are winsorized at the 1st and 99th percentiles. *t*-statistics, reported in parentheses, are based on the robust standard errors clustered at the firm level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable		
	OLS	2SLS	
	ΔR&D	First-Stage: Preset Structure	Second-Stage: ΔR&D
	1	2	3
Preset Structure	**−0.0013** (−2.57)**		
One-Year SOP		**0.1942*** (6.37)**	
Instrumented Preset Structure			**−0.0159** (−2.02)**
Ln (TDC1)	−0.0011** (−2.42)	0.0965*** (10.60)	0.0018* (1.75)
Equity Pay Ratio	0.0042*** (3.72)	0.2047*** (8.25)	0.0035* (1.69)
Ln (MV)	0.0009*** (3.36)	0.0101* (1.73)	0.0006* (1.94)
Tobin Q	0.0035*** (9.32)	−0.0065 (−1.46)	0.0034*** (8.47)
Ret Volatility	0.0445*** (5.88)	−0.9807*** (−8.92)	0.0258** (2.27)
Firm Age	−0.0001*** (−6.50)	0.0014*** (3.94)	−0.0001*** (−3.38)
CEO Age	−0.0001 (−1.44)	−0.0032*** (−3.69)	−0.0001** (−2.34)
CEO_First_Year	−0.0011 (−1.63)	−0.0732*** (−3.98)	−0.0016* (−1.66)
Inside_CEO	−0.0010** (−2.03)	0.0040 (0.23)	−0.0008 (−1.38)
R&D Missing	−0.0083*** (−9.44)	−0.0283 (−1.34)	−0.0079*** (−8.04)
Year FE	Yes	Yes	Yes
Ind FE	Yes	Yes	Yes
Observations	11,437	11,437	11,437
Adjusted R^2	0.179	0.172	0.072

coefficient of *Preset Structure* is −0.0013 (*t*-stat. = −2.57). This result suggests that the use of a preset pay structure is negatively associated with a firm's R&D growth.

Columns 2–3 report the results of the 2SLS analysis. Column 2 reports the results of the first-stage regression. The dependent variable indicates whether a firm adopts a preset pay structure. The key independent variable is our IV, *One-Year SOP*. Confirming its relevance, the result shows that a high vote for one-year SOP increases a firm's likelihood of using a preset pay structure in setting CEO compensation. The *t*-statistic of the coefficient on *One-Year SOP* is 6.37, suggesting that it is a strong instrument. Column 3 reports the second-stage results. Consistent with

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

our hypothesis, the estimated coefficient of the instrumented preset pay structure is −0.0159, with a robust *t*-statistic of −2.02. This result suggests that presetting pay structure leads to a 1.59 percentage points decline in ΔR&D. The economic magnitude of this effect is sizeable as it equals 3.8 times of the mean (=0.0159/0.0042) and over half a standard deviation (0.0223) of ΔR&D.

Overall, using fixed-value plans and preset pay structure as examples of value-based practices, we find evidence supporting the hypothesis that compared with share-based plans, value-based plans weaken a CEO's incentive to invest in value-enhancing projects.

V. Why Do Firms Use Value-Based Practices to Grant Equity?

Why do firms use value-based practices in setting CEO equity grants? As far as we know, this question has not been formally investigated. This section attempts to fill this void, focusing specifically on the roles of retention pressure (Section V.A) and corporate governance (Section V.B).

A. Retention Pressure and Value-Based Equity Grants

Retention pressure could motivate all three value-based practices of granting equity. For example, a firm tends to closely track its executives' compensation on an outside benchmark that reflects the executives' external opportunities (Bizjak, Lemmon, Naveen (2008), Bizjak, Lemmon, Nguyen (2011)). A firm's retention need could motivate the firm's use of a preset-structure practice because such a practice facilitates the comparison of a compensation contract's pay structure with outside offers. Furthermore, Hall (1999) conjectures that retention risk could be a key reason why boards adopt multi-year fixed-value plans (although he does not test it). Finally, value-based equity grants could also help with retention because a preset equity value appeals to risk-averse CEOs.

1. Measuring a Firm's CEO Retention Pressure

We introduce four sets of variables to measure a firm's retention pressure. These variables reflect the i) demand and ii) supply conditions a firm faces in the managerial labor market, iii) the incumbent CEO's personal marketability, and iv) her skill portability. Specifically, we use two variables to gauge the external demand for a firm's CEO (i.e., the CEO's outside opportunities). The first is the number of other companies citing the firm as a compensation peer (*Citation*). More citations indicate more outside interest in and attention on the CEO (Francis, Hasan, Mani, and Ye (2016), Choi, Cicero, and Mobbs (2022)) and, thus, increased retention pressure. The second is the size of the social network the CEO has acquired through her career, education, and other social activities (*Network Size*) (Hacamo and Kleiner (2022), Faleye, Kovacs, and Venkateswaran (2014)). A larger network could impose greater retention pressure on the firm because it exposes the CEO to more outside opportunities. A CEO with an extensive network is also more likely to have general and portable skills (Falato, Li, and Milbourn (2015), Custodio, Ferreira, and Matos (2013)).

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

The second set of variables intends to capture the supply condition of the managerial labor market. A firm that can easily replace a departing CEO has low retention pressure. We introduce one variable to capture the internal CEO supply and another to capture the external CEO supply. The first, *CID NO*, is the number of certified inside directors (inside directors who also hold outside board seats, or CIDs) the firm has. Previous studies show that CIDs are an important internal source of CEOs (Masulis and Mobbs (2011), Beneish, Marshall, and Yang (2017)). Ceteris paribus, a firm with more CIDs has lower retention pressure. The second, *Size Percentile*, intends to quantify the depth of the external managerial talent supply. Prior literature suggests that small firms have a greater external supply pool of CEO talent than large firms (Gabaix and Landier (2008), Cai, Sevilir, and Yang (2015)). *Size Percentile* is defined as the percentile of a firm's sales within its 2-digit SIC industry, multiplied by 100. The greater *Size Percentile* is, the shallower a firm's external CEO supply pool is and, therefore, the greater the retention pressure.[17]

The third aspect of a firm's retention pressure is related to a CEO's marketability based on such personal characteristics as age and founder status. Neither very young nor very old CEOs generate significant retention pressure: Young ones lack experience, while old ones are increasingly likely to retire. We thus introduce a dummy variable, *Marketable Age*, that equals 1 if the incumbent CEO is between 45 and 55 years old, and 0 otherwise. Founder CEOs are less likely to leave for another company, so they too generate less retention pressure. We thus introduce a dummy, *Founder*, that equals 1 if the CEO is a founder and 0 otherwise.

Finally, we use a firm's business uniqueness to identify the portability of a CEO's managerial skill. If a firm is unique in its products or services, the incumbent CEO's managerial skill is likely to be highly firm-specific and difficult to transport to other firms. Therefore, a firm with a unique business tends to have lower retention pressure. The dummy *Business Uniqueness* equals 1 if the firm's average business-similarity score with its 20 most similar firms (Hoberg and Phillips (2010), (2016)) is below the sample median and 0 otherwise. Please refer to Table 1 for the summary statistics of these variables.

Based on these seven inputs, we construct a *Retention Pressure Score* below:

$$\begin{aligned} \text{(4)} \qquad \textit{Retention Pressure Score} = {} & D(\textit{Citation} > \textit{median}) \\ & + D(\textit{Network Size} > \textit{median}) + D(\textit{CIDNO} = 0) \\ & + D(\textit{Size Percentile} > 50\textit{th}) \\ & + D(\textit{Marketable Age} = 1) \\ & + D(\textit{Founder} = 0) \\ & + D(\textit{Business Uniqueness} = 0) \end{aligned}$$

For any variable X in this equation, D(X) equals 1 if the condition defined on X is satisfied, and 0 otherwise. By construction, the higher the score, the greater a

[17]In a robustness check, we also use the logarithm of sales (*Ln(Sales)*) as an alternative measure of retention pressure. Our results remain similar but are omitted for brevity.

TABLE 8

Why Do Firms Pay Equity Based on Value? The Role of Retention Pressure

Table 8 uses a logistic regression model to examine the effect of retention pressure on the likelihood of a firm making value-based equity grants. The dependent variable, *Value-Based Practice*, equals 1 if a firm uses any type of value-based practice (column 1), a fixed-value plan (column 2), a preset-structure plan (column 3), or a strict pay-tracking practice (column 4); and equals 0 if the firm uses a share-based plan. The key independent variable, *Retention Pressure Score*, comprises seven indicators related to the demand for and supply of a firm's CEO. Please refer to Appendix A for the definitions of *Retention Pressure Score* and other control variables. The sample includes firms in ExecuComp with information for analysis from 2006 to 2022. In each model, only firm-years using the particular form of value-based practice and those using a share-based practice are included. All variables are winsorized at the 1st and 99th percentiles. *t*-statistics, reported in parentheses, are based on the robust standard errors clustered at the firm level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Value-Based Practice Dummy			
Value-Based Practice =	Any Value-Based Versus Share-Based	Fixed Value Versus Share-Based	Preset Structure Versus Share-Based	Pay Tracking Versus Share-Based
	1	2	3	4
Retention Pressure Score	**0.2031*** (10.69)**	**0.1199*** (4.75)**	**0.2438*** (11.43)**	**0.2115*** (10.57)**
Ln (MV)	0.2165*** (10.04)	0.3110*** (12.34)	0.2859*** (11.35)	0.2138*** (9.32)
Tobin Q	−0.1096*** (−6.47)	−0.1330*** (−5.23)	−0.0985*** (−4.91)	−0.1386*** (−7.45)
Ret Volatility	−2.3610*** (−6.16)	−5.0524*** (−8.69)	−2.4397*** (−5.51)	−2.6418*** (−6.26)
CEO_First_Year	−0.2809*** (−4.08)	−1.0821*** (−9.66)	−0.2787*** (−3.58)	−0.3727*** (−4.91)
Inside_CEO	0.1699*** (2.62)	0.1694* (1.94)	0.1613** (2.10)	0.1844*** (2.68)
Year FE	Yes	Yes	Yes	Yes
Ind FE	Yes	Yes	Yes	Yes
Observations	24,836	9,924	17,164	20,192
Pseudo R^2	0.074	0.130	0.111	0.083

firm's retention pressure. The average *Retention Pressure Score* in our sample is 3.943.[18]

2. Regression Analysis

To examine the relationship between a firm's retention pressure and its likelihood of adopting a value-based practice, we use the following logistic regression:

$$(5)\quad Logit(Value\text{-}Based\ Practice_{i,t}) = \beta_0 + \beta_1 Retention\ Pressure\ Score_{i,t-1} + \gamma Controls_{i,t-1} + \alpha_j + \mu_t + \varepsilon_{i,t}$$

Year- and industry-fixed effects are included. Because many firms' retention-pressure scores are persistent over time, we do not include firm-fixed effects in this analysis. We additionally control for firm size, Tobin Q, return volatility, CEO turnover, and inside CEOs. Table 8 reports the results.[19] We find that all three types

[18]Prior literature has used firm performance to measure a CEO's intrinsic skill or external opportunities (see, e.g., Rajgopal, Shevlin, and Zamora (2006), Albuquerque, De Franco, and Verdi (2013), and Beneish, Marshall, and Yang (2017)). We refrain from doing so because firm performance is highly endogenous and cannot be solely attributed to CEO talent. In an untabulated test, we include both a firm's citations by peers and a firm's historical performance in one regression and find that citation subsumes the effect of firm performance in explaining retention pressure. Results are available from the authors.

[19]In the Supplementary Material, we report the relationships between each retention-pressure measure and a firm's likelihood of using value-based practices.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

of value-based practices are strongly and positively associated with a firm's retention pressure.

Both retention pressure and a firm's decision to use value-based practices in setting equity grants could be driven by some unobserved factors. To establish a causal link between the two, we exploit the change in a firm's business headquarters. Researchers have found that executive labor markets can be local (Yonker (2017)). As such, a firm's changing its business headquarters can generate a shock to the demand or supply condition of a firm's managerial talents and, in turn, to the firm's retention pressure. On the exclusion restriction, we argue that headquarters relocation is unlikely to be driven by a firm's executive compensation policies.[20]

To identify a firm's headquarters, we use the zip code of the business address the firm discloses in its proxy statement. We introduce three dummies indicating three types of changes in business headquarters. First, if a firm changes its business headquarters in year *t*, the dummy *Headquarters Change* equals 1 for all years following, and 0 otherwise. Second, if the new headquarters co-locates with more S&P 1500 firms' headquarters within a 100-mile radius than its old headquarters, then the dummy *Move to More Firms* equals 1 in all following years, and 0 otherwise. Finally, if the new headquarters co-locates with fewer S&P 1500 firms' headquarters, then the dummy *Move to Fewer Firms* equals 1 in all following years, and 0 otherwise. To avoid overlapping pre- and post-move periods, we only consider relocating firms that relocate only once during the sample period.

Panel A of Table 9 shows that about 8.2% of our sample firms changed their business headquarters during our sample period. Among them, over half (4.3% of sample firms) moved to a location with more S&P 1500 firm headquarters, while the rest (3.9% of sample firms) moved to a location with fewer S&P 1500 firm headquarters. Panel B of Table 9 tests the relevance of the three dummies. Column 1 confirms that a headquarters change increases the retention pressure for a firm. Column 2, where we decompose *Headquarters Change* into *Move to More Firms* and *Move to Fewer Firms*, shows that the effect of a headquarters change is entirely driven by firms moving to denser business neighborhoods.

To better understand why *Move to More Firms* increases a firm's retention pressure, we examine, in columns 3–6 of Panel B, the relationships of this dummy with four retention-related variables that reflect a firm's CEO demand and supply: *Citation*, *Ln Network Size*, *CID NO*, and *Size Percentile.* These results show that when a firm moves its headquarters to a location with more S&P 1500 firms, i) citation increases (*increased demand* for the CEO), and ii) the number of certified inside directors decreases (*decreased supply* of internal CEO candidates). Relocation to a place with more firms can increase a firm's citation probably because the firm/CEO becomes visible to more firms. Relocation can also reduce the number of certified inside directors if the directors have

[20]Prior literature suggests that firms relocate their headquarters to improve operational efficiency and reduce operating costs (Aarland et al. (2007), Strauss–Kahn and Vives (2009)), to save taxes (Voget (2011), Laamanen et al. (2012)), or for political reasons (Chen, Yan, and Yang (2020)). These factors are unrelated to compensation policies.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

TABLE 9

Retention Pressure and Value-Based Equity Grants – Two-Stage IV Analysis

Table 9 uses the 2-stage IV probit model to examine the effect of retention pressure on the likelihood of a firm making value-based equity grants. We rely on a firm's headquarters change for identification. Panel A reports three dummies related to the headquarters change. If a firm changes its business headquarters in year *t*, the dummy *Headquarters Change* equals 1 for all years following, and 0 otherwise. If the new headquarters co-locate with more (fewer) S&P 1500 firms' headquarters within a 100-mile radius than its old headquarters, then *Move to More Firms* (*Move to Fewer Firms*) equals 1 in the following years, and 0 otherwise. Panel B explains why we chose *Move to More Firms* as our IV. Panel C reports the results of the second-stage IV probit model. The sample includes firms in ExecuComp with information for analysis from 2006 to 2022. Panel D reports the second-stage IV probit regression results for a matched sample containing firms moving to a location with more S&P 1500 firms and control firms matched on year, industry, pre-move state, and sales, in the [−3, +3] years around the relocations. In each model of Panels C and D, only firm-years using the particular form of value-based practice and those using a share-based plan are included. Panels B, C, and D include the same controls as in Table 8. Please refer to Appendix A for the definitions of the control variables. All variables are winsorized at the 1st and 99th percentiles. *t*-statistics, reported in parentheses, are based on the robust standard errors clustered at the firm level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Headquarters Changes

	N	Mean	SD	Min	p25	Median	p75	Max
Headquarters Change	32,882	0.082	0.274	0.000	0.000	0.000	0.000	1.000
Move to More Firms	32,882	0.043	0.202	0.000	0.000	0.000	0.000	1.000
Move to Fewer Firms	32,882	0.039	0.194	0.000	0.000	0.000	0.000	1.000

Panel B. First-Stage Analysis: Finding the Right Instrumental Variable

	Selection of IV		Why *Move-to-More-Firms* Increases Retention Pressure			
Dependent Variable	Retention Pressure Score		Citation	Ln Network Size	CID NO	Size Percentile
	1	2	3	4	5	6
Headquarters Change	**0.1546*** (2.83)**					
Move to More Firms		**0.2428*** (3.48)**	**0.7723* (1.81)**	0.1179 (1.49)	**−0.0878* (−1.91)**	0.9150 (0.80)
Move to Fewer Firms		0.0554 (0.71)				
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Ind FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23,709	23,709	23,709	23,709	23,709	23,709
Adjusted R^2	0.208	0.209	0.471	0.221	0.223	0.810

Panel C. Second-Stage IV-Probit Result

	Dependent Variable: Value-Based Practice Dummy			
Value-Based Practice =	Any Value-Based Versus Share-Based	Fixed Value Versus Share-Based	Preset Structure Versus Share-Based	Pay Tracking Versus Share-Based
	1	2	3	4
Instrumented Retention Pressure Score	**0.3172* (1.89)**	**0.4432*** (2.74)**	**0.3293* (1.73)**	**0.3807** (2.16)**
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Ind FE	Yes	Yes	Yes	Yes
Observations	23,709	9,467	16,356	19,257

Panel D. Years [−3, +3] Matched Sample Results

	Dependent Variable: Value-Based Practice Dummy			
Value-Based Practice =	Any Value-Based Versus Share-Based	Fixed Value Versus Share-Based	Preset Structure Versus Share-Based	Pay Tracking Versus Share-Based
	1	2	3	4
Instrumented Retention Pressure Score	**0.6435*** (4.24)**	**0.6796*** (3.36)**	**0.5322** (2.28)**	**0.5943*** (3.56)**
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Ind FE	Yes	Yes	Yes	Yes
Observations	2,202	841	1,552	1,785

increased outside opportunities in the new location, or if they are reluctant to relocate with the firm. Importantly, both contribute to increased retention pressure.

Given these results, we choose the dummy *Move to More Firms* as our instrumental variable. The F-statistic for the test of the null hypothesis (that the instrument has a 0 coefficient) is roughly 12 (square of the *t*-stat. of 3.48), suggesting that the instrument is strong. Panel C of Table 9 reports the second-stage results, using the IV-probit model. They are largely consistent with Table 8. The estimated coefficients of the predicted retention-pressure score are significant and positive in all 4 columns, supporting a positive effect of retention pressure on the use of value-based practices.

One potential concern is that the effect of relocation may not be long-lived which could weaken our results in the full sample. To address this concern, we restrict our sample to the 7 years around each headquarters relocation for firms moving to a location with more S&P 1500 firms, plus nonrelocating firms matched by year, industry, pre-move headquarters state, and sales (in the 50% to 150% bandwidth), and re-estimate our IV-probit model. Panel D of Table 9 shows that the instrumented retention score has significant coefficients for all value-based practices. As expected, these coefficients are larger in magnitude and more statistically significant than those in Panel C.

B. Corporate Governance and Value-based Equity Grants

In this subsection, we explore the role of corporate governance in explaining a firm's use of value-based equity grants. Previous studies show that entrenched CEOs can abuse pay-setting policies for their own benefit (e.g., Bebchuk and Fried (2003), (2005), Faulkender and Yang (2010), (2013)) (the entrenchment view). On the other hand, good governance firms could be more willing to make value-based equity grants because effective governance mechanisms can offset the anti-incentive effects of such grants (the optimal contracting view).

1. Measuring a Firm's Governance Quality

Based on the previous literature, we use five proxies to measure a firm's governance quality: The percentage of independent directors on the board (*Board Indp. Ratio*), the percentage of busy directors on the board (*Board Busy Ratio*), the proportion of board members hired by the incumbent CEO (*Board Coopted Ratio*) (Coles, Daniel, and Naveen (2014)), CEO-Chairman duality (*CEO Chair*), and the institutional blockholder ownership (*Inst Block Ownership*). The board characteristics are constructed from the BoardEx database, and the institutional blockholder ownership is constructed from the 13F files compiled by Thomson Reuters. Please refer to Table 1 for the summary statistics of these governance-related variables. We summarize these five governance measures in a *Governance Quality Score* defined as follows:

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

$$\begin{aligned}(6)\quad Governance\ Quality\ Score = {} & \mathrm{D}(Board\ Indp.\ Ratio > \text{median}) \\ & + \mathrm{D}(Board\ Busy\ Ratio < \text{median}) \\ & + \mathrm{D}(Board\ Coopted\ Ratio < \text{median}) \\ & + (1 - CEO\,Chair) \\ & + \mathrm{D}(Inst\ Block\ Ownership > \text{median}).\end{aligned}$$

The mean governance quality score of our sample is 2.64. By construction, the greater the score, the higher the firm's governance quality.

2. Regression Analysis

To examine the relationship between a firm's governance quality and its likelihood of using a value-based practice, we first run the following logistic regression:

$$\begin{aligned}(7)\quad Logit(Value\text{-}Based\ Practice_{i,t}) = {} & \beta_0 + \beta_1 Governance\ Quality\ Score_{i,t-1} \\ & + \gamma Controls_{i,t-1} + \alpha_j + \mu_t + \varepsilon_{i,t}\end{aligned}$$

Panel A of Table 10 reports the results. As in Tables 8 and 9, the dependent variable is a dummy indicating whether a firm uses any or each specific value-based practice (vs. the share-based practice). The key independent variable is the governance quality score. We include the same set of controls as in Table 8. In column 1, we find a significantly positive coefficient on *Governance Quality Score*, indicating that firms with better monitoring efficiency are more likely to use value-based equity grants. This result is robust when each of the three forms of value-based practice is considered. It remains unchanged after we control for retention pressure score (please refer to the Supplementary Material for this result).[21] Overall, these findings do not support the entrenchment view but are in line with the optimal contracting view.

To address potential endogeneity concerns, we follow Wintoki, Linck, and Netter (2012) to use a Generalized Method of Moments (GMM) model. The GMM model accounts for unobservable heterogeneity and potential simultaneity between governance and a firm's pay setting choice (Hermalin and Weisbach (1988)). Similar to Wintoki et al., we use the fifth and sixth lags of the variables in the GMM system (value-based practices, governance quality scores, and control variables), firm age, and year dummies as instruments in the GMM estimation. Under this specification, we cannot reject the null that all instruments are valid (based on the Hansen test of over-identification) and that the instruments used for the equations in levels are exogenous (based on the Diff-in-Hansen test of exogeneity). The GMM results are presented in Panel B of Table 10. We find that the coefficient on governance quality is insignificant for any of the value-based practices. We also split the sample by retention pressure as the optimal contracting view predicts a particularly strong effect of governance for firms facing high retention pressure. However, we continue to find insignificant results in all subsamples. The results

[21] The correlation between *Governance Quality Score* and *Retention Pressure Score* is low (0.08).

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

TABLE 10

Corporate Governance Quality and the Use of Value-Based Equity Grants

Panel A of Table 10 uses a logistic regression model to examine the association between a firm's governance quality and the firm's likelihood of making value-based equity grants. The dependent variable, *Value-Based Practice*, equals 1 if a firm uses any type of value-based practice (column 1), a fixed-value plan (column 2), a preset-structure plan (column 3), or a pay-tracking practice (column 4); and equals 0 if the firm uses a share-based plan. The key independent variable *Governance Quality Score* comprises five indicators related to the board quality and institutional ownership. Panel B uses a dynamic-panel Generalized Method of Moments (GMM) model to account for unobservable heterogeneity and potential simultaneity between governance and a firm's equity pay setting choice. Similar to Wintoki, Linck, and Netter (2012), we use the fifth and sixth lags of the variables in the GMM system (value-based practices, governance quality scores, and control variables), firm age, and year dummies as instruments in the GMM estimation. The sample includes firms in ExecuComp with information for analysis from 2006 to 2022. In each model, only firm-years using the particular form of value-based practice and those using a share-based practice are included. The dependent variable is a dummy indicating whether a firm uses a value-based practice in granting equity. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test of exogeneity is under the null that instruments used for the equations in levels are exogenous. We include the same set of controls as in Table 8 that are not reported for brevity. All variables are winsorized at the 1st and 99th percentiles. *t*-statistics, reported in parentheses, are based on the robust standard errors clustered at the firm level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Value-Based Practice Dummy			
Value-Based Practice =	Any Value-Based Versus Share-Based	Fixed Value Versus Share-Based	Preset Structure Versus Share-Based	Pay Tracking Versus Share-Based
	1	2	3	4
Panel A. Logistic Regression				
Governance Quality Score	**0.1464*** (8.08)**	**0.0629** (2.46)**	**0.1664*** (7.79)**	**0.1545*** (7.92)**
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Ind FE	Yes	Yes	Yes	Yes
Observations	29,074	11,132	20,195	23,661
Pseudo R^2	0.071	0.124	0.105	0.077
Panel B. GMM Regression				
Governance Quality Score	0.0120 (0.44)	0.0649 (0.87)	0.1169 (0.50)	−0.2353 (−1.21)
L.Value-Based Practice	−0.0053 (−0.02)	1.3833*** (22.73)	3.4690*** (2.82)	3.3240** (2.09)
L2.Value-Based Practice	0.2316 (0.88)	0.2157 (0.44)	0.8248 (0.57)	−0.2458 (−0.15)
L3.Value-Based Practice	0.1215 (0.75)	−0.0616 (−0.50)	−0.7581 (−0.52)	1.5513 (1.14)
L4.Value-Based Practice	−0.0014 (−0.07)	0.0022 (0.03)	−0.0037 (−0.02)	−0.2133** (−2.29)
Controls	Yes	Yes	Yes	Yes
Observations	19,057	5,906	13,101	14,963
AR(1) Test (*p*-value)	0.407	0.012	0.033	0.010
AR(2) Test (*p*-value)	0.559	0.030	0.686	0.326
Hansen Test of Over-Identification (*p*-value)	0.240	0.314	0.000	0.066
Diff-in-Hansen Test of Exogeneity (*p*-value)	0.178	0.237	0.601	0.365

remain unchanged if we use other lags as instruments. Both results can be found in the Supplementary Material.

In sum, the GMM analyses suggest that when endogeneity is accounted for, corporate governance is not significantly related to firms' use of value-based practices. Our current evidence for the optimal contracting view is thus limited to the logistic regression framework. Yet, we recognize that identifying the causal effect of governance is always a challenging task. Despite our best efforts, we cannot completely rule out the possibility the results might be still subject to some

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

endogeneity. These results are also consistent with a world in which both entrenchment and optimal contracting contribute to the use of value-based equity grants.

VI. Conclusion

Whenever a firm uses any of the three pay-setting practices – fixed-value plans, presetting pay structure, or strict pay tracking – the dollar amount of equity grants tends to be predetermined. That is, instead of granting equity by shares, firms grant equity by value. Under value-based equity grants, two anti-incentive effects can arise. First, the level of the equity grant can be less directly linked to recent stock performance. Second, the number of equity instruments a CEO receives can be inverse with recent stock performance, which could weaken the CEO's wealth-performance sensitivities over time. Both effects can discourage CEOs from working harder for their shareholders. Consistent with this hypothesis, we find that CEOs from firms that use value-based equity-granting practices are more reluctant to increase investments in research and development. Overall, this paper highlights an unintended consequence of popular practices of setting a target equity pay level or structure for their CEOs.

Retention and incentives are two main goals of compensation contract design. We find a firm's pressure to retain its CEO is a key reason for value-based practices, which can lead to suboptimal incentives. As such, this paper also suggests that the disagreement about the priority of retention and incentives can create conflicts between boards and investors. On the other hand, we also find some suggestive evidence for optimal contracting theory that well-governed firms are more likely to make value-based equity grants. But we cannot completely rule out an entrenched CEO story.

Supplementary Material

To view supplementary material for this article, please visit http://doi.org/10.1017/S0022109025000018.

Appendix A. Variable Definitions

1. Variables Related to the Value-Based Equity Grants

Fixed Value: A dummy indicating whether the value of an option or stock grant is fixed over time. It equals 1 if the ratio of the reported amount of option-based pay (stock-based, or total equity pay) in year t to that of year $t-1$ is between 0.97 and 1.03 and stock price change from year $t-1$ to year t is more than +/−3%, and 0 otherwise.

Preset Structure: A dummy indicating whether a firm presets the structure of CEO compensation. It equals 1 if i) the ratio of equity pay to total pay has a regular value such as equal to 5%×n (n = 1 to 19) or 1/3 or 2/3; ii) for firms paying both options and stock, the ratio of stock-based pay (or option-based pay) to equity-based pay has a regular value as defined above, *or* the ratio between the stock pay and option pay, or its reciprocal, has a regular value as defined above; or iii) one of the ratios calculated above is the same as that of the previous year (within the 0.97–1.03

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

bandwidth and stock price change from year $t-1$ to year t is more than +/−3%). Otherwise, it equals 0.

Pay Tracking: A dummy indicating whether a firm closely tracks an external benchmark in setting CEO compensation. It equals 1 if i) the ratio of the CEO's total pay to benchmark-implied total pay is between 0.75 and 1.25 (*total pay tracking*); ii) the ratio of the CEO's equity pay to benchmark-implied equity pay is between 0.75 and 1.25 (*equity pay tracking*); or iii) any pay-to-benchmark ratio identified in i) or ii) are the same as last year (within the 0.97–1.03 bandwidth and stock price change from year $t-1$ to year t is more than +/−3%) (*fixed pay tracking*). Otherwise, it equals 0. To measure the benchmark pay, we use the median CEO total pay (equity pay) of the companies from the same 2-digit SIC industry as the focal firm with comparable sales (that is, a sales level within the range of 50% to 150%). If a firm discloses a specific benchmark or specific target percentile, we use the median or the target percentile of the disclosed peers' CEO pay as the benchmark pay.

Value-Based Practice: A dummy that equals 1 if *Fixed Value* equals 1, *Preset Structure* equals 1, or *Pay Tracking* equals 1; and 0 otherwise.

Share-Based Practice: A dummy indicating no value-based practice is used.

Persistent Value-Based Practice: A dummy that equals 1 in year *t* if a firm practices any type of *value-based equity grants* consecutively for 2 (3, or 4) years, and 0 otherwise.

2. CEO Equity Pay and Other Incentive-Related Variables

Ln (TDC1): The natural logarithm of total CEO compensation *TDC1*, from ExecuComp.

Ln Equity Pay: The natural logarithm of CEO compensation in equity (restricted stocks and options), from ExecuComp.

Equity Pay Ratio: The ratio of equity pay (restricted stocks and options) to total compensation.

Ln Portfolio Delta (ex ante Pay-Performance Sensitivity): The natural logarithm of expected change in CEO wealth in thousand dollars for a 1% change in stock price. A CEO's wealth includes her entire portfolio of stocks and options of her company. It is computed as in Core and Guay (2002) based on the ExecuComp information.

3. Variables Used to Identify the Real Consequence of Value-Based Equity Grants

ΔR&D: Annual change in R&D expenditure scaled by lagged sales.

Extrapolated Fixed Value: A dummy that equals 1 for 2 (3) years following a completed cycle of a 2-year (3-year) fixed-value contract, and 0 otherwise.

One-Year SOP: Fractional vote for the once-a-year frequency of say-on-pay.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

4. Retention-Pressure-Related Variables

Citation: Number of companies that cite the sample firm *i* in their compensation peer groups. Based on the data collected from proxy statements.

Ln Network Size: The natural logarithm of number of individuals with whom the CEO shares a common education, employment, or social history. Based on the BoardEx data.

CID NO: Number of certified inside executive directors on board at the fiscal year-end. A nonCEO inside executive is a CID when she has served on the board of at least one other public firm at the fiscal year-end. Based on the BoardEx data.

Size Percentile: A firm's percentile in terms of sales within its 2-digit SIC industry.

Marketable Age: A dummy that equals 1 if CEO age as reported by ExecuComp is between 45 and 55 years old, and 0 otherwise.

Founder: A dummy that equals 1 if the CEO is the firm's founder, and 0 otherwise. The data is from Lee, Hwang, and Chen (2017) and SEC filings.

Business Uniqueness: A dummy variable that equals 1 if firm *i*'s business-similarity score with its 20 most similar firms is below the sample median, and 0 otherwise. We use the pairwise similarity score of Hoberg and Phillips (2010) to estimate a firm's business-similarity score.

Retention Pressure Score: A score that equals D(*Citation* > median) + D(*Network Size* > median) + D(*CID NO* = 0) + D(*Size Percentile* > 50th) + D(*Marketable Age* = 1) + D(*Founder* = 0) + D(*Business Uniqueness* = 0).

Headquarters Change: A dummy that equals 1 in all following years if a firm changes its business zip code in year *t*, and 0 otherwise. We extract a firm's business address from its proxy statement.

Move to More Firms: A dummy that equals 1 if the headquarters moves, and there are more S&P 1500 firm headquarters within a 100-mile radius of the new headquarters than of the old one, and 0 otherwise.

Move to Fewer Firms: A dummy that equals 1 if the headquarters moves, and there are fewer S&P 1500 firm headquarters within a 100-mile radius of the new headquarters than of the old one, and 0 otherwise.

5. Governance-Quality Related Variables

Board Indp. Ratio: The percentage of independent board members. Constructed from BoardEx.

Board Busy Ratio: The percentage of busy directors on a firm's board. A director is busy if she holds more than 2 outside board seats. Constructed from BoardEx.

Board Coopted Ratio: The percentage of coopted directors on a firm's board. A director is coopted if she joined the board after the CEO assumes office. Constructed from BoardEx.

CEO Chair: A dummy that equals 1 if the CEO is also the board chairperson, and 0 otherwise. From ExecuComp.

Inst Block Ownership: The total fractional ownership held by block institutional investors that own at least 5% of a firm's outstanding shares. Constructed from 13F.

Governance Quality Score: A score that equals D (*Board Indp. Ratio* > median) + D (*Board Busy Ratio* < median) + D (*Board Coopted Ratio* < median) + D(*CEO Chair* = 0) + D (*Inst Block Ownership* > median).

6. Control Variables and Other Variables Used

Ret before Option Grant: Yearly stock return up to the option grant date.

Ret before Stock Grant: Yearly stock return up to the stock grant date.

Ln Cumulative Ret: The logarithmic gross cumulative stock return of a firm up to year *t*, starting from the CEO's inauguration month.

Ln(MV): The natural logarithm of the market capitalization of a firm at the end of the fiscal year. From Compustat.

Tobin Q: (Equity Market Capitalization + Total Assets – Book Equity)/Total Assets. Constructed from Compustat.

Ret Volatility: The standard deviation of monthly returns of the stock in a year. Constructed from CRSP.

CEO Tenure: The number of years as a CEO. It equals the fiscal year minus the year when the CEO takes office, plus 1. Computed from ExecuComp.

CEO_First_Year: A dummy indicating the year a new CEO takes office. Constructed from ExecuComp.

Inside_CEO: A dummy indicating whether the CEO is hired from inside the firm. Constructed from ExecuComp.

Firm Age: The number of years that a firm appears in Compustat up to year *t.*

CEO Age: CEO's age in year *t.* From ExecuComp.

R&D Missing: A dummy indicating whether a firm-year has missing R&D in Compustat.

Appendix B. Value-Based Equity Grants: Examples Based on Proxy Statements

I. Fixed-Value Plans

(i). Denbury Resources Inc – 2012.

We believe equity awards for senior management align the interests of senior management (and all other employees) with those of our stockholders … **In light of the 2011 results, the total long-term compensation value was left relatively unchanged from 2011 to 2012.**

(ii). Nike Inc – 2012.

In July 2012, the Committee granted a restricted stock award to Mr. Parker (CEO) valued at $3,500,000, representing 75,206 shares of our Class B Stock, based on the closing price of our stock on the grant date and as adjusted for the stock split. **This was the same value of restricted stock granted to Mr. Parker in July 2011.**

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

(iii). Ryder System Inc – 2009.

In February 2009, our independent directors approved an LTI award with a value of $3,355,000 to Mr. Swienton, which converted to 163,390 stock options, 35,900 PBRSRs and a $670,971 PBCA. **The LTI value awarded to Mr. Swienton for 2009 was unchanged from the amount awarded in 2008.**

II. Presetting Pay Structure

(i). Service Corp – 2011.

In February of each year, the Compensation Committee sets the components of the long-term incentive compensation for that year. Awards granted in 2011 under our long-term incentive compensation program consisted of three components to provide balance and focus for the Named Executive Officers. Each form of long-term incentive is designed to ensure that appropriate focus is given to driving the Company's stock price appreciation, managing the ongoing operations and implementing strategy and ensuring superior total shareholder returns. The program consists of **equal targeted expected value** delivered for long-term incentives in the form of: i) Stock Options; ii) Restricted Stock; and iii) Performance Units.

(ii). Matson Inc – 2012.

For the 2012 annual grant made in January, **30 percent of the award value was in stock options, 30 percent was in time-based restricted stock units ("TBRSUs") and 40 percent was in performance-based restricted stock units ("PBRSUs").**

(iii). Best Buy – 2014.

The fiscal 2014 LTI featured a mix of performance shares, stock options and time-based restricted shares. This results in a balanced portfolio of compensation rewards consisting of, for the CEO, **50% performance-based restricted shares (to reward performance), 20% stock options (to reward share price appreciation) and 30% time-based restricted shares** (to promote retention).

III. Pay Tracking

(i). Intel Corp – 2010.

To assist the Compensation Committee in its review of executive compensation for 2010, Intel's Compensation and Benefits Group provided compensation data compiled from executive compensation surveys, as well as data gathered from annual reports and proxy statements from companies that the committee has selected as **a "peer group" for executive compensation analysis purposes**. … **The peer group includes 15 technology companies and 10 companies outside the technology industry**.

(ii). Visa Inc – 2010.

In order to be competitively positioned to attract and retain key executives, we target total compensation for named executive officers, including salary, annual incentive target and long-term incentive target, **at the 50 percentile of compensation paid to similarly situated executive officers of the companies comprising our compensation peer group.**

(iii). Dow Chemical Co – 2014.

Dow chooses this component (equity-based LTI) of compensation to motivate and reward employees for long-term stockholder value creation and the attainment of

Company performance goals, retain top talent and create an ownership alignment with stockholders. As with Dow's approach for all elements of compensation, **LTI grant levels are targeted at the median of the Survey Peer Group for comparable positions**. Performance metrics and stock price determine the actual payout of LTI grants.

References

Aarland, K.; J. Davis; V. Henderson; and Y. Ono. "Spatial Organization of Firms: The Decision to Split Production and Administration." *Rand Journal of Economics*, 38 (2007), 480–494.

Albuquerque, A.; G. De Franco; and R. Verdi. "Peer Choice in CEO Compensation." *Journal of Financial Economics*, 108 (2013), 160–181.

Bebchuk, L., and J. Fried. "Executive Compensation as an Agency Problem." *Journal of Economic Perspectives*, 17 (2003), 71–92.

Bebchuk, L., and J. Fried. "Pay Without Performance: Overview of the Issues." *Journal of Applied Corporate Finance*, 17 (2005), 8–23.

Beneish, M.; C. Marshall; and J. Yang. "Explaining CEO Retention in Misreporting Firms." *Journal of Financial Economics*, 123 (2017), 512–535.

Bertrand, M., and S. Mullainathan. "Are CEOs Rewarded for Luck? The Ones Without Principals Are." *Quarterly Journal of Economics*, 116 (2001), 901–32.

Bizjak, J.; M. Lemmon; and L. Naveen. "Does the Use of Peer Groups Contribute to Higher Pay and Less Efficient Compensation?" *Journal of Financial Economics*, 90 (2008), 152–168.

Bizjak, J.; M. Lemmon; and T. Nguyen. "Are All CEOs Above Average? An Empirical Analysis of Compensation Peer Groups and Pay Design." *Journal of Financial Economics*, 100 (2011), 538–555.

Cai, Y.; M. Sevilir; and J. Yang. "Made in CEO Factories." Working Paper, Indiana University (2015).

Chen, S.; X. Yan; and B. Yang. "Move to Success? Headquarters Relocation, Political Favoritism, and Corporate Performance." *Journal of Corporate Finance*, 64 (2020), 101698.

Choi, D.; D. Cicero; and S. Mobbs. "CEO Marketability, Employment Opportunities, and Compensation: Evidence from Compensation Peer Citations." *Journal of Financial and Quantitative Analysis*, 57 (2022), 2766–2797.

Coles, J.; N. Daniel; and L. Naveen. "Coopted Boards." *Review of Financial Studies*, 27 (2014), 1751–1796.

Core, J., and W. Guay. "Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility." *Journal of Accounting Research*, 40 (2002), 613–630.

Cremers, M., and Y. Grinstein. "Does the Market for CEO Talent Explain Controversial CEO Pay Practices?" *Review of Finance*, 18 (2013), 921–960.

Custodio, C.; M. Ferreira; and P. Matos. "Generalists Versus Specialists: Lifetime Work Experience and Chief Executive Officer Pay." *Journal of Financial Economics*, 108 (2013), 471–492.

Denis, D. "Mandatory Clawback Provisions, Information Disclosure, and the Regulation of Securities Markets." *Journal of Accounting and Economics*, 54 (2012), 197–200.

Edmans, A.; T. Gosling; and D. Jenter. "CEO Compensation: Evidence from the Field." Working Paper, London Business School (2022).

Edmans, A.; V. Fang; and K. Lewellen. "Equity Vesting and Investment." *Review of Financial Studies*, 30 (2017), 2229–2271.

Falato, A.; D. Li; and T. Milbourn. "Which Skills Matter in the Market for CEOs? Evidence from Pay for CEO Credentials." *Management Science*, 61 2015, 2845–2869.

Faleye, O.; T. Kovacs; and A. Venkateswaran. "Do Better-Connected CEOs Innovate More?" *Journal of Financial and Quantitative Analysis*, 49 (2014), 1201–1225.

Faulkender, M., and J. Yang. "Inside the Black Box: The Role and Composition of Compensation Peer Groups." *Journal of Financial Economics*, 96 (2010), 257–270.

Faulkender, M., and J. Yang. "Is Disclosure an Effective Cleansing Mechanism? The Dynamics of Compensation Peer Benchmarking." *Review of Financial Studies*, 26 (2013), 806–839.

Francis, B.; I. Hasan; S. Mani; and P. Ye. "Relative Peer Quality and Firm Performance." *Journal of Financial Economics*, 122 (2016), 196–219.

Gabaix, X., and A. Landier. "Why Has CEO Pay Increased So Much?" *Quarterly Journal of Economics*, 123 (2008), 49–100.

Gopalan, R.; T. Milbourn; F. Song; and A. Thakor. "Duration of Executive Compensation." *Journal of Finance*, 69 (2014), 2777–2817.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press

Hacamo, I., and K. Kleiner. "Competing for Talent: Firms, Managers, and Social Networks." *Review of Financial Studies*, 35 (2022), 207–253.
Hall, B. J., and J. B. Liebman. "Are CEOs Really Paid Like Bureaucrats?" *Quarterly Journal of Economics*, 112 (1998), 653–691.
Hall, B. J. "The Design of Multi-Year Stock Option Plans." *Journal of Applied Corporate Finance*, 12 (1999), 97–106.
Hermalin, B., and M. Weisbach. "The Determinants of Board Composition." *Rand Journal of Economics*, 19 (1988), 589–606.
Hoberg, G., and G. Phillips. "Product Market Synergies and Competition in Mergers and Acquisitions: A Text-Based Analysis." *Review of Financial Studies*, 23 (2010), 3773–3811.
Hoberg, G., and G. Phillips. "Text-Based Network Industries and Endogenous Product Differentiation." *Journal of Political Economy*, 124 (2016), 1423–1465.
Holmstrom, B., and P. Milgrom. "Aggregation and Linearity in the Provision of Intertemporal Incentives." *Econometrica*, 55 (1987), 303–328.
Kogan, L.; D. Papanikolaou; A. Seru; and N. Stoffman. "Technological Innovation, Resource Allocation, and Growth." *Quarterly Journal of Economics*, 132 (2017), 665–712.
Laamanen, T.; T. Simula; and S. Torstila. "Cross–Border Relocations of Headquarters in Europe." *Journal of International Business Studies*, 43 (2012), 187–210.
Lee, J.; B. Hwang; and H. Chen. "Are Founder CEOs More Overconfident than Professional CEOs? Evidence from S&P 1500 Companies." *Strategic Management Journal*, 38 (2017), 751–769.
Masulis, R., and S. Mobbs. "Are All Inside Directors the Same? Evidence from the External Directorship Market." *Journal of Finance*, 66 (2011), 823–872.
Murphy, K. J. "Corporate Performance and Managerial Remuneration: An Empirical Analysis." *Journal of Accounting and Economics*, 7 (1985), 11–42.
Murphy, K. J. "Executive Compensation: Where We Are, and How We Got There." In *Handbook of the Economics of Finance* Vol. 2 (2013), 211–356.
Oyer, P. "Why Do Firms Use Incentives that Have No Incentive Effects?" *Journal of Finance*, 59 (2004), 1619–1650.
Rajgopal, S.; T. Shevlin; and V. Zamora. "CEOs' Outside Employment Opportunities and the Lack of Relative Performance Evaluation in Compensation Contracts." *Journal of Finance*, 61 (2006), 1813–1844.
Shue, K., and R. Townsend. "Growth Through Rigidity: An Explanation for the Rise in CEO Pay." *Journal of Financial Economics*, 123 (2017a), 1–21.
Shue, K., and R. Townsend. "How Do Quasi-Random Option Grants Affect CEO Risk-Taking?" *Journal of Finance*, 72 (2017b), 2551–2588.
Stock, J. H., and M. Yogo. "Testing for Weak Instruments in Linear IV Regression." In *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg*, D. W. K. Andrews, J. H. Stock, eds. Cambridge, United Kingdom: Cambridge University Press (2005), 80–108.
Strauss–Kahn, V., and X. Vives. "Why and Where Do Headquarters Move?" *Regional: Science and Urban Economics*, 39 (2009), 68–186.
Sundaram, R., and D. Yermack. "Pay Me Later: Inside Debt and its Role in Managerial Compensation." *Journal of Finance*, 62 (2007), 1551–1588.
Voget, J. "Relocation of Headquarters and International Taxation." *Journal of Public Economics*, 95 (2011), 1067–1081.
Xu, J., and J. Yang. "Golden Hellos: Signing Bonuses for New Top Executives." *Journal of Financial Economics*, 122 (2016), 175–195.
Wintoki, M. B.; N. Linck; and J. Netter. "Endogeneity and the Dynamics of Internal Corporate Governance." *Journal of Financial Economics*, 105 (2012), 581–606.
Yonker, S. "Geography and the Market for CEOs." *Management Science*, 63 (2017), 609–630.

https://doi.org/10.1017/S0022109025000018 Published online by Cambridge University Press