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Executive compensation: The trend toward one-size-fits-all

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ABSTRACT

I report and analyze a recent "one-size-fits-all" trend in the structure of executive compensation plans. Since 2006, 24% of the variation in the distribution of CEO compensation across pay components — salary, bonus, stock awards, options, non-equity incentives, pensions, and perquisites — disappeared. This uniformity might come at the expense of optimal incentives, as increases in pay structure similarity translate into lower shareholder value. Using panel data regressions and plausibly exogenous shocks, I find that institutional investors' influence, proxy advisors' recommendations, and expanded compensation disclosure are salient drivers of this standardization. The findings highlight an unintended consequence of recent regulations enhancing shareholders' participation and expanding compensation disclosure.

1. Introduction

Executive compensation is a key tool to incentivize managers through the combination of various pay components. In this paper, I document that the structure of these components has significantly homogenized over the last decade, even though, in principle, the optimal incentive contract is a function of many parameters that differ across firms. Using a spatial representation of contracts that considers all the main pay components (salary, bonus, stock awards, options, non-equity incentives, pensions, and perquisites), I find that 24% of the variation in CEO compensation structures has disappeared since 2006. Remarkably, this phenomenon affects all public firms regardless of size, age, profitability, or even industry — and it shows few signs of slowing down.

Two recent changes in corporate governance may well drive this standardization: (a) greater presence and participation of institutional investors in firms' governance, and (b) higher levels of compensation disclosure. First, the growing influence of institutional investors might increase standardization in pay structure if they have standardized preferences, promote "one-size-fits-all" practices, or believe that a homogeneous contract is optimal and that deviations likely indicate agency problems. Moreover, the growing influence of proxy advisory firms, which act as information intermediaries by providing advice to institutional investors, can help coordinate investors around a one-size-fits-all trend. Second, expanded disclosure of executive pay can create uniformity in compensation structures if it helps boards of directors design compensation plans by learning from their peers. It can also enhance the standardizing effect of institutional investors and proxy advisors, as it facilitates scrutiny and comparisons across firms.

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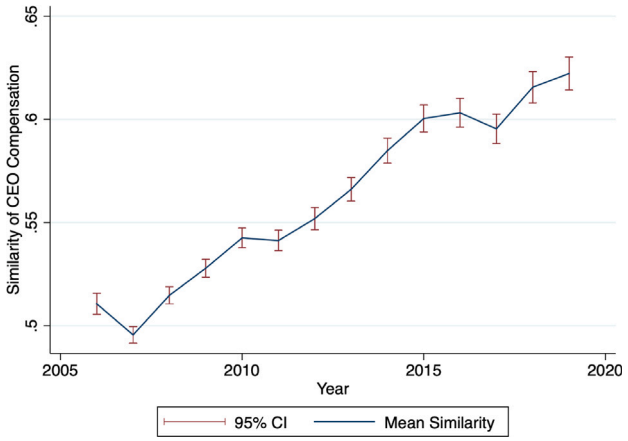

Fig. 1. Average cosine similarity of CEO compensation structures.
The figure shows the time-series plot of the mean cosine similarity of compensation plans. The vector of compensation used to calculate the cosine similarity includes salary, bonus, stock awards, stock options, non-equity incentives, and other compensation.

Because pay structure is critical to incentivizing managers, I also study whether this standardization has consequences for firm value. If pay structures are standardized due to labor markets becoming more efficient and directors being better informed, contract uniformity can improve firm value. Similarly, standardization from increased external influences can improve the design of compensation plans if a firm's board of directors is not able or incentivized to do it themselves (e.g., Bebchuk et al., 2002; Bebchuk and Fried, 2003). However, it can also be harmful if these external forces are not well-informed about the optimal compensation of a specific firm, or if the need to obtain their support forces boards to offer an inferior compensation structure, as Murphy and Jensen (2018), Hayne and Vance (2019), and Edmans et al. (2023) suggest. Moreover, understanding the role of proxy advisors in this standardization and its consequences can further shed light on the role of information intermediaries and their potential agency conflicts, particularly in terms of providing unbiased and accurate information and advice (Dranove and Jin, 2010).

I use a direct measure of pay structure similarity that accounts for the multidimensionality of contracts and simultaneously examines all pay components. For each firm, I first create a multidimensional vector that includes the fraction of each pay component in the total compensation, then I measure the similarity between two compensation plans as the cosine similarity of the two vectors.[2] This measure takes values from zero (meaning the compensation vectors are orthogonal) to one (meaning the compensation bundles have the same components). Finally, I calculate the average similarity for each firm's compensation vector across all firms, to run a firm-level analysis.

The average pay structure similarity increased from 0.5 in 2007 to 0.62 in 2019, as Fig. 1 illustrates. Similar levels and trends of standardization emerge if I separate the sample based on industry, firm size, age, and profitability. The results are also robust to excluding any pay component, implying that no single pay component can explain the standardization by itself. Furthermore, using a similar methodology, I find a similar trend in the metrics that companies use to set CEOs' goals and performance evaluations.

Confirming the influence of institutional investors on pay structure similarity, I find that as a firm increases its proportion of institutional ownership, its average pay structure similarity also increases. This positive effect is stronger when institutional investors have higher incentives to engage with the focal firm (measured by the incentive measure developed by Lewellen and Lewellen, 2022). In contrast, it is weaker when they are less involved in the focal firm's governance policies (measured by the distraction measure developed by Kempf et al., 2017). Moreover, I find a positive and significant interaction between the influence of institutional investors and a time trend, demonstrating that their influence has grown over time.

A key challenge in this analysis is that institutional influence is endogenous, and the positive correlations described above do not necessarily imply that institutional investors are pushing firms to standardize CEO contracts. For example, these investors may prefer to invest in companies with standardized compensation plans without directly promoting standardization. Alternatively, omitted variables (e.g., corporate culture or information disclosure) may simultaneously increase institutional ownership and compensation structure similarity. For this reason, I use the SEC's 2011 implementation of Say-on-Pay (SOP) as a quasi-natural experiment that exogenously increased the influence of institutional investors on the design of executive compensation in a way unrelated to firm characteristics, information disclosure, or the level of institutional ownership.

SOP is the practice of publicly-traded companies submitting their executive compensation plans to a shareholder vote. When the SEC implemented mandatory SOP votes in 2011, it also required that shareholders vote on the frequency of that voting. Specifically, each firm's shareholders voted on whether SOP votes would occur every one, two, or three years. If shareholders' influence increases

[2] I reach similar conclusions when using alternative methodologies to measure the similarity of compensation plans, such as quantile regressions, the Kullback–Leibler (KL) divergence test, and the Kolmogorov–Smirnov (KS) test.

pay structure similarity, firms with SOP votes every year should have higher levels of similarity than firms with SOP votes every two or three years.

To test this hypothesis, I estimate a sharp regression discontinuity design (RDD) around the one-year-SOP margin of victory. Because the RDD estimation focuses on close elections, firms in which one-year-SOP won against three-year-SOP by a narrow margin are a good counterfactual for those firms where the opposite occurs — as if treatment was randomly assigned — and thus, the estimated effect is unlikely to be affected by firm characteristics, level of institutional investors, or other forces like information disclosure.[3] Supporting the investors' influence hypothesis, I find an increase of almost 10% in pay structure similarity when SOP frequency sharply changes from three-year to one-year SOP votes.

I also examine whether increases in available information about other firms' compensation make compensation structures more similar between firms, and if this effect is linked to institutional investors. Here I use the introduction of the Compensation Discussion and Analysis (CD&A) rule in 2006 as a quasi-natural experiment that exogenously increased the available information about other firms. I follow Gipper, 2021 and exploit the variation in the rule's timing, since it came into force depending on the fiscal year-end date of each firm. Specifically, the mandate required compensation disclosures in the proxy statement covering the fiscal year ending on or after December 15, 2006. Thus, for each firm, I calculate the compensation similarity to the firms with a year-end in December and, separately, its similarity to the firms with a year-end in September–November. The former firms reported CD&A in 2006, whereas the latter did not.

Supporting the peers' disclosure hypothesis, I find that firms' compensation structure is significantly more similar to the compensation of firms that reported CD&A that year than to those that did not. Importantly, this effect is significantly larger when the firm has more institutional investor ownership, and also when those investors have higher incentives to engage with the firm's management. These results suggest that easier comparison across firms increases standardization and also facilitates institutional investors' influence on pay designs.[4]

I next examine the role of proxy advisory firms behind these effects. Most institutional investors follow the recommendations of proxy advisors (McCahery et al., 2016, Ertimur et al., 2013, Malenko and Shen, 2016, Larcker et al., 2015), even though this advice might be based on guidelines that do not accurately take into account the different needs and goals of heterogeneous companies (Gordon, 2009, Hou et al., 2017, Murphy and Jensen, 2018, Hayne and Vance, 2019, Edmans et al., 2023, Levit and Tsoy, 2022). For example, in a survey study, Hayne and Vance (2019) explicitly report that *"proxy advisors generally use a one-size-fits-all approach to voting recommendations (p. 970)"*. Even though there is no data on the information flow between proxy advisors and institutional investors, I do observe their recommendations when voting in a proxy meeting. Using these recommendations I run four tests, whose results suggest that advisors' influence on institutional investors explains at least part of the standardization.

First, I find that pay structure similarity increases more if the firm received a negative SOP recommendation from ISS — the leading proxy advisor — in the past. Second, the less similar a firm's compensation structure is to other firms, the more likely the firm will receive a negative SOP recommendation from ISS in the next period. Third, when firms receive higher scrutiny from ISS due to poor SOP support, they tend to standardize their compensation plans.[5] This finding is robust to using an RDD estimation, as in Dey et al. (2023). Fourth, firms' compensation structures converge to a simulated vector that mimics the implicitly preferred vector behind the ISS's recommendations on SOP.

Finally, I examine the consequences of this standardization for firm value. I first show that compensation structures have moved away from what firms' fundamentals would predict. Unless the link between fundamentals and compensation plans has changed abruptly in recent years, this separation implies that either optimal contracts have changed or the current standardization is moving pay packages away from an optimal design. In line with the latter interpretation, using panel regressions with firm and year fixed effects, I find a negative association between ex-ante pay structure similarity and ex-post pay-performance sensitivity and Tobin's Q. I find similar results when examining cumulative abnormal daily returns, using a one-year window. These findings are difficult to reconcile with labor markets becoming more efficient, but they do align with a one-size-fits-all trend that, on average, prevents boards from tailoring compensation plans to individual firms' needs and individual CEOs' characteristics.

It is natural to ask why institutional investors would foster a standardization that reduces firm value. One possible explanation is that the advice they receive — and follow — from proxy advisory firms is not always optimal, as many studies suggest (e.g., Larcker et al., 2013, Hou et al., 2017, Murphy and Jensen, 2018, Hayne and Vance, 2019, Albuquerque et al., 2022a, and Edmans et al., 2023). Investors might not be aware of this negative effect, or even if they are aware, following the advice might work as a safe harbor in case they are accused of a fiduciary duty breach. Other benefits of standardization might also compensate for these lower returns. For example, since it is costly for institutional investors to identify an optimal compensation plan for every firm they invest in, they might prioritize the most important firms in their portfolio and apply a one-size-fits-all strategy to the rest. Supporting this explanation, I find that the negative effects of standardization concentrate on firms with a lower impact on institutional investors' payoffs. To address endogeneity in these firm-value analyses, I estimate a Two-Stage Least Squares (2SLS) regression, using the standardization of compensation plans by overlapping-board firms in different industries as an instrument, and find robust results.

[3] Indeed, in validating tests, I do not find differences in terms of firm size, age, profitability, or institutional ownership around the threshold.

[4] I also find that the compensation structure of companies becomes more similar when they are more likely to be learning from each other. In particular, two companies increase their pay structure similarity when they become part of the same benchmarking compensation group (the peers that each firm more closely observes when it defines its compensation plans), when they share a common director, when they have headquarters in the same zip code, and when they have the same compensation consultant.

[5] When a firm's SOP voting support falls below 70%, ISS conducts a qualitative review of the firm's shareholder engagement efforts. If the company does not demonstrate adequate responsiveness, ISS generally recommends a vote against the SOP proposal and the compensation committee members in the next proxy meeting (see Denis et al., 2020 and Dey et al., 2023).

My findings contribute to several areas of the literature. First, I report a new stylized fact of executive compensation illustrating economy-wide standardization in the structure of pay. This finding empirically supports the concern that companies might face growing external pressure when designing their executive compensation plans. Murphy and Jensen (2018) argue that excessive regulations have limited firms' flexibility in CEO compensation design. Hou et al. (2017) suggest that boards are overly concerned with "best practices", potentially moving away from optimal plans. Similarly, Hayne and Vance (2019) and Edmans et al. (2023) present survey evidence showing that boards feel pressure to conform to "best practices", even against their own preferred compensation plans. I provide compelling evidence for such constraints, using both correlations and plausibly exogenous sources of variation.

My findings also complement recent studies reporting that levels of total CEO pay have also become less diverse. For example, Jochem et al. (2022) report that since 2006, CEOs with lower pay levels have experienced a sharper increase in pay than those with higher pay. Similarly, Kalpathy et al. (2021) show that central firms in the benchmarking peer network influence pay growth at other firms. I also complement (Albuquerque et al., 2024) and their finding that CEO compensation contracts have become more complex in recent years, in part due to the influence of external forces, and with negative implications for firm performance. They propose a complexity measure based, among other things, on the number of performance metrics included in a compensation package. I build on their findings by showing that companies are using an increasing number of performance metrics uniformly.

Second, my results contribute to the literature showing that institutional investors actively influence firms' policies (Brav et al., 2008, Aghion et al., 2013, Appel et al., 2016, Schmidt and Fahlenbrach, 2017) and validates the concern that they might be fostering one-size-fits-all solutions to complex corporate governance problems, as Larcker and Tayan (2019) suggest. My findings join other examples of one-size-fits-all practices believed to be "good governance" that do not increase shareholder value (e.g., independent Chair (Dey et al., 2011, Krause et al., 2014), staggered boards (Faleye, 2007, Johnson et al., 2015, Cremers et al., 2017), and dual-class shares (Cremers et al., 2024, Anderson et al., 2017)).

Third, my paper adds to the literature on boards' choice of performance metrics. Prior research argues that performance measures should vary with several firm-level characteristics, including company strategy and the informativeness of the CEO's actions (e.g., Ittner et al., 1997, Bouwens and Van Lent, 2007, De Angelis and Grinstein, 2015, Bushman et al., 2016). The standardization in the type of performance metrics I document, along with a decline in firm value, suggests that boards may face constraints in choosing their performance metrics optimally. Thus, I complement the qualitative evidence from Hayne and Vance (2019) by providing large-sample archival evidence of homogenization in the choice of performance measures. My findings also suggest the existence of ratcheting on pay structure and performance metrics, which complements the pay-level ratcheting effect reported by Bizjak et al. (2008) and Cadman and Carter (2014). Moreover, this effect may create path dependency in the metrics selection, which could enhance the target ratcheting effect that previous studies have reported when firms define their performance targets (see Weitzman, 1980, Murphy, 2000, and Bouwens and Kroos, 2011). More research on this topic is likely to be fruitful.

Fourth, my paper also contributes to the literature on information intermediaries. While intermediaries like credit rating agencies, certifiers, or proxy advisors are crucial for market functionality (Boot et al., 2006), they also introduce a range of agency conflicts when it comes to providing unbiased and accurate information and advice (Dranove and Jin, 2010). The finding that proxy advisors drive similarity in compensation, leading to a decline in firm value, underscores the dangers of excessive reliance on information intermediaries and aligns with previous concerns reported by Hayne and Vance (2019), Levit and Tsoy (2022) and Dey et al. (2023).

Fifth, I contribute to the literature on the effects of compensation disclosure. For example, Gipper (2021) shows that pay disclosures are associated with increases in pay, mainly because they reduce boards' flexibility and increase the pressure to meet with "best practices". I find analogous findings regarding compensation structure similarity.

Finally, I provide a new measure of pay structure similarity, which will be useful for future research.

2. Literature review and conceptual framework

Compensation arrangements include different components such as salary, bonus, stock awards, option awards, non-equity incentives, pensions, and perquisites. Their respective proportions form a specific pay structure, which is usually linked to the incentives that firms want to give their executives (e.g., Edmans et al., 2017). Previous studies suggest that this structure should vary depending on the firm's characteristics (such as size, age, industry, level of competition, and information asymmetries) and goals (e.g., Fama, 1980, Nalebuff and Stiglitz, 1983, Holmström and Tirole, 1989, Sklivas, 1987, Gabaix and Landier, 2008, Manso, 2011), as well as on the CEO's cost of effort, risk aversion, wealth, and career concerns (e.g., Stiglitz, 1975, Mirrlees, 1976, Holmström, 1979, 1982, Gibbons and Murphy, 1992).

Despite a vast literature on the costs and benefits of using each of these compensation components, one-size-fits-all trends in corporate governance might be affecting the design of executive compensation (Hou et al., 2017, Murphy and Jensen, 2018, Hayne and Vance, 2019, Edmans et al., 2023). Larcker and Tayan (2019) and many other scholars have raised concerns about a tendency across companies to implement overgeneralized standard solutions to complex problems, a trend strengthened by the rise of institutional investors and their active participation in the management of firms, as well as by recent regulations including expanded compensation disclosure and shareholders' rights. In light of this one-size-fits-all concern, I first hypothesize that there exists convergence in compensation packages.

Hypothesis 1. The structure of executive compensation is homogenizing.

2.1. Growing influence from institutional investors

To understand the potential causes of this standardization, I first hypothesize that companies face growing external pressure from institutional investors to follow a one-size-fits-all template for their compensation packages. Institutional investors and proxy advisory firms have significantly increased their influence on corporate policies (e.g., Brav et al., 2008, Aghion et al., 2013, Appel et al., 2016, Schmidt and Fahlenbrach, 2017, Dasgupta et al., 2021, Lewellen and Lewellen, 2022), and they frequently advocate for standard solutions or "best practices" in many of the firms they invest in. For example, in a survey study, McCahery et al. (2016) report that 63% of institutional investors have engaged in direct discussions with management while 45% have had private discussions with a company's board without the management. Similarly, Lewellen and Lewellen (2022) report a persistent increase in the incentives of institutional investors to engage in corporate governance activities. They attribute this stronger influence to the growth of index funds and exchange-traded funds, which allow institutions to make large-dollar investments and create economies of scale for active engagement.

The growing influence of institutional investors on executive compensation plans might increase standardization in pay structure if they have standardized preferences and/or promote one-size-fits-all practices. Thus, I hypothesize that institutional investors contribute to the standardization of executive pay structure, especially when they more actively influence the firm's management.

Hypothesis 2a. Institutional investors contribute to the standardization of executive pay structure.

Hypothesis 2b. Institutional investors' effect on pay structure standardization is stronger when they are more likely to engage with a firm's management and influence its corporate policies.

2.1.1. Proxy advisory firms and homogeneously informed investors

Major investors routinely rely on proxy advisory firms for recommendations related to corporate governance practices. McCahery et al. (2016) surveyed institutional investors and find that most investors both use proxy advisors and believe the advisors' information improves their voting decisions. Moreover, empirical studies show that proxy advisors' interactions with investors have grown significantly in the last 15 years, and that their influence on executive compensation schemes became stronger with SOP mandatory adoption.[6]

Some researchers have raised the concern that proxy advisors' advice and recommendations are based on guidelines that do not accurately consider companies' unique needs and goals. For example, Larcker et al. (2013) point out that the proxy advisors' data collection process relies on too few participants and is not a good market representation. Others claim that proxy advisers do not update their policies frequently enough. Gordon (2009), Hou et al. (2017), and Murphy and Jensen (2018) argue that the small number of proxy advisors[7] increases the chance of a "best compensation practices" regime pushing towards a one-size-fits-all trend. Additionally, in a theoretical paper, Matsusaka and Shu (2020) show that proxy advisory firms might have incentives to ignore firm-specific characteristics if the competition across advisors is low.

Levit and Tsoy (2022) similarly show that if proxy advisors' recommendations are non-verifiable and they have a conflict of interest with at least one of their clients, they will provide a one-size-fits-all recommendation in environments where one size does not fit all. Through a field study, Edmans et al. (2023) report that boards feel pressure to conform to proxy advisors' preferences despite their own preferred compensation philosophies.[8] Hayne and Vance (2019) explicitly report that "proxy advisors generally use a one-size-fits-all approach to voting recommendations (p. 970)". They also highlight operational constraints faced by proxy advisors during busy seasons. Along similar lines, Albuquerque et al. (2022a) show that ISS only detects low-quality compensation packages during the off-season.

Given the concern that proxy advisory firms are likely to give one-size-fits-all recommendations, I hypothesize that their recommendations are associated with increases in compensation structure similarity.

Hypothesis 2c. Proxy advisory firms foster standardization of compensation structure.

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[6] For example, Ertimur et al. (2013) analyze ISS and Glass Lewis & Co. (GL) voting recommendations for SOP and find that negative ISS (GL) recommendations are associated with 24.7% (12.9%) more votes against the compensation plan. Malenko and Shen (2016) exploit a cutoff rule in ISS voting guidelines and find that a negative recommendation led to a 25% reduction in SOP voting support. Similarly, Larcker et al. (2015) find that firms change their compensation policies to avoid proxy advisory firms' negative recommendations.

[7] There are only five proxy advisory firms in the United States: Institutional Shareholder Services (ISS), Glass Lewis & Co. (GL), Egan-Jones Proxy Services, Segal Marco Advisors, and ProxyVote Plus. Together, ISS and GL account for 95% of the market. Please see Copland et al. (2018) and Shu (2024) for an overview of the proxy advisory industry.

[8] They find that 59% of directors have offered less CEO pay to avoid controversy with shareholders (55% because of proxy advisors) and 54% have offered a worse pay structure to avoid controversy with shareholders (55% because of proxy advisors). Additionally, 77% of directors believe they need to follow market practices more closely.

2.2. Expanded compensation disclosure

A second potential cause for this convergence is the expanded disclosure of executive pay, which facilitates comparison and mimicking across firms. Learning from their peers can help boards of directors design compensation plans, and if this practice becomes common, it can create some uniformity in compensation structure. For example, Cadman et al. (2021) show that equity grants by compensation peers significantly determine a firm's equity grants. Furthermore, Jochem et al. (2022) report that the mandatory disclosure of compensation peer groups contributes to a rise in reciprocal benchmarking and translates into lower dispersion in the level of CEO total compensation. Thus, I expect expanded disclosure to increase compensation structure standardization.

Hypothesis 3a. An increase in available information about other firms' compensation makes compensation structure more similar between firms.

Expanded compensation disclosure also allows greater scrutiny from institutional investors since they can more easily compare different compensation elements in different companies. For the same reason, it can also affect proxy advisors' recommendations. Thus, I hypothesize that the disclosure effect is stronger when institutional investors are highly present and involved with the firm.

Hypothesis 3b. An increase in available information about other firms' compensation makes compensation structure more similar, especially when there is a high proportion of institutional investors and when they are more likely to engage with a firm's management and influence its corporate policies.

The possibility of these combined effects also accentuates the need for exogenous variations in institutional investors' influence and compensation disclosure. Therefore, to test all these hypotheses accurately, I exploit two different exogenous shocks in my empirical analysis: one increasing investors' influence and another increasing compensation disclosure.

2.3. Consequences of standardization of compensation structure

Ex-ante, the effect of standardizing compensation plans on firm value is not obvious. Standardization can be beneficial if it eliminates deviations from optimal structures. Conversely, it can be undesirable if it prevents firms from tailoring contracts to their needs and the CEO's characteristics.

Standardization of contracts due to boards of directors being better informed about best compensation practices is likely to improve the design of compensation, and is thus expected to affect firm value positively. Similarly, standardization from increased external influences can improve the design of compensation plans if the board of directors is not capable of doing so by itself (e.g., Bebchuk et al., 2002; Bebchuk and Fried, 2003). However, this external pressure can also be harmful if the need for investor support forces boards to offer an inferior compensation structure. For example, in Edmans et al. (2023), 72% of directors claim that the need to obtain investor support has forced them to offer an inferior compensation structure that, paradoxically, they believe harms shareholder value. Linking these concerns to compensation disclosure, Gipper (2021) show that higher disclosures are associated with increasing pay because they reduce boards' flexibility to make ex post adjustments or to use subjectivity, instead pressuring boards toward more formulaic plans. In the end, the effect of standardization on firm value is an empirical question.

Hypothesis 4a. If standardization is mainly due to more efficient labor markets, there will be a positive correlation between compensation structure similarity and firm value.

Hypothesis 4b. If standardization prevents boards from designing optimal compensation plans, there will be a negative correlation between the similarity of compensation structure and firm value.

If Hypothesis 4b is true, why would institutional investors foster a standardization that reduces firm value? As suggested earlier, one explanation might be that institutional investors are unaware of this negative effect. Alternatively, they might get other benefits from the standardization that compensate for these lower returns, motivating them to follow proxy advisory firms' recommendations even if they believe they are sub-optimal. Moreover, because tailoring is costly and requires close monitoring and research, a sub-optimal standardization could be beneficial if it protects them from the cost of tailoring a compensation structure for each of the firms they invest in. If this is the case, they might prioritize those firms that are more important in their portfolios and implement a sub-optimal one-size-fits-all strategy for the others. Additionally, because of these costs, institutions have incentives to free-ride off one another, with a suboptimal equilibrium in which nobody reviews the compensation plans with adequate detail. These incentives are especially relevant when the firms do not significantly affect the investors' profits.

Hypothesis 4c. Standardization of compensation structures is most harmful to firms that are less relevant for institutional investors.

3. Data and methodology

I obtain data on executive compensation from Execucomp, collected directly from each company's annual proxy (DEF14 A SEC form). The universe of firms covers the S&P 1500 plus companies that were once part of the 1500, along with companies removed from the index that are still trading. I merge the Execucomp sample with other datasets using the Global Company Key — or GVKEY — firm identifier.

I base my main analysis on six elements of compensation: salary, bonus, stock awards, option awards, non-equity incentives, and other compensation. Salary and bonus reflect the amount received for the fiscal year. Stock awards are evaluated using the grant-date market value, including both time-lapse restricted stock and performance shares. Options awards are evaluated at grant-date value, using different variants of the (Black and Scholes, 1973) formula. Non-equity incentives are evaluated at the target level (or the average of minimum and maximum if the target is not reported). Other compensation includes perquisites, signing bonuses, termination payments, and above-the-market interest paid on deferred compensation.

Accounting measures come from CRSP/Compustat. All variables are winsorized at the 1% and 99% levels. The baseline sample, measured between 2006 and 2019, includes 2735 firms with 28,062 firm-year observations. The average sample firm has $12.9 billion in total assets, is 21.8 years old, and has an ROA of 11% and a Tobin's Q of 1.54. The average executive receives nearly 27.3% of her total compensation in salary, 4.3% in bonuses, 30.6% in stock awards, 12.6% in options, 19.7% in non-equity incentive plans, and 5.5% in other compensation. The summary statistics for these ratios resemble those reported for the same variables in previous studies (e.g., Murphy, 2013 and Edmans et al., 2017).

3.1. Measure of pay structure similarity

The main challenge in examining compensation similarity is that executives receive compensation in many forms. A standard deviation analysis and quantile regressions of each pay component, presented in IA1 in the Internet Appendix, both suggest that contract structures are becoming less dispersed around the average structure, implying standardization over time. However, since these analyses only examine one compensation component at a time, they cannot evaluate similarity in the whole compensation structure. It is the entirety of the package, rather than any single element in isolation, that shapes the CEO incentives. An analysis of the entire compensation structure requires looking at all components simultaneously.

For each firm, I thus create a vector that includes the six primary components of compensation: salary, bonus, stock awards, option awards, non-equity incentives, and other compensation. Because each of these elements is measured with a monetary value, the vector of payments is comparable across firms. I scale each element by the total compensation, such that the sum of each vector's elements equals one. In this way, the vector measures the structure of the compensation plan rather than its level.

$$v_{it} = \left[\frac{salary_{it}}{total_{it}}, \frac{bonus_{it}}{total_{it}}, \frac{stock_{it}}{total_{it}}, \frac{options_{it}}{total_{it}}, \frac{non\_eq_{it}}{total_{it}}, \frac{other_{it}}{total_{it}}\right] \tag{1}$$
$$total_{it} = salary_{it} + bonus_{it} + stock_{it} + options_{it} + non\_eq_{it} + other_{it}$$

I then compute the similarity between the compensation vectors of every possible pair of firms in each given year, using the dot product of the two vectors. This cosine similarity is the most widely reported measure of vector similarity for cases when the magnitude of the vectors does not matter (Bhattacharyya, 1946, Salton and McGill, 1983, Hoberg and Phillips, 2016).[9]

$$Similarity(i,j) = \frac{\sum_{n=1}^{6} v_{it}^{n} v_{jt}^{n}}{\sqrt{\sum_{n=1}^{6}(v_{it}^{n})^2}\sqrt{\sum_{n=1}^{6}(v_{jt}^{n})^2}} \qquad \text{with } v_{ij}^{n} = n\text{th element of } v_{ij} \tag{2}$$

Specifically, cosine similarity measures the similarity between two non-zero vectors of an inner product space by measuring the cosine of the angle between them. It can take values from zero to one: two vectors with the same orientation have a cosine similarity of one, while two orthogonal vectors have a zero similarity. For each firm, I calculate the average cosine similarity concerning all other sample firms in each year.

$$Compensation\ Similarity_i = \frac{\sum_{j\neq i}^{N} Similarity(i,j)}{N} \qquad \text{with } N = \text{all firms in Execucomp} \tag{3}$$

This methodology has many advantages. It allows me to compare the structure of contracts at a firm level, considering all pay elements simultaneously. Importantly, it also compares element by element in a multidimensional way. In other words, it measures spatial representation, considering each element as a different axis. For the same reason, it is easy to interpret since it is analogous to a measure of geographic distance.

4. The standardization of compensation structure

I start my empirical analysis by testing Hypothesis 1. Supporting a standardization of pay structure, Fig. 1 shows a sharp and persistent upward trend in the mean value of pay structure similarity. The average pay structure similarity increased from 0.496 in

[9] Internet Appendix IA2 shows that all the findings I present in this paper are robust to using two other measures of similarity: the Kullback–Leibler Divergence test and the Kolmogorov–Smirnov test.

Table 1
Time trend of the cosine similarity of CEO compensation packages.

Panel A: Baseline compensation vector

	CEO Comp Similarity in t		
	(1)	(2)	(3)
Trend	0.009***	0.009***	0.011***
	(0.000)	(0.000)	(0.000)
Observations	28,062	26,685	28,062
R-squared	0.141	0.151	0.141
Industry FE		YES	
Firm FE			YES

Panel B: Compensation vector excluding each type of compensation one by one

	CEO Comp Similarity in t					
	Element excluded:					
	Salary	Bonus	Stocks	Options	Non eq	Other
Trend	0.017***	0.010***	0.007***	0.009***	0.010***	0.011***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	27,842	28,061	28,041	28,056	28,062	27,981
R-squared	0.206	0.122	0.058	0.097	0.107	0.157
Firm FE	YES	YES	YES	YES	YES	YES

Panel A presents the results of the OLS panel regression of the cosine similarity on a time trend. Column (2) includes industry fixed effects and Column (3) includes firm fixed effects. Panel B presents the results of a similar regression. However, in each column, the similarity is calculated after excluding one element of compensation at a time from Eq. (1). Standard errors are clustered by firm and reported in parentheses. Significance levels are indicated: *=10%, **=5%, ***=1%.

2007 to 0.622 in 2019. This increase in similarity corresponds to one full standard deviation and implies that 24% of the average distance across compensation structures disappeared in the last thirteen years. More formally, Panel A in Table 1 shows the results of a regression of pay structure similarity on a time trend. The coefficient is positive and statistically significant, and it is robust to including firm fixed effects. On average, the average similarity increases 0.01 points — equivalent to a 2% increase of the unconditional mean — every year.

I observe similar levels and trends of standardization if I separate the sample based on firm size, age, and profitability. Additionally, all industries in the sample follow similar trends and the magnitude of standardization within industries is identical to the whole sample, in terms of both level and trend. The time series trend remains the same if I exclude firms that are in the same industry, which means that the standardization is not driven by increases in similarity only among firms in the same industry. Importantly, Panel B in Table 1 shows that the coefficient of the time trend is robust to excluding any pay component from the compensation vector (importantly, calculations also exclude the component from the total compensation used to scale the vector), implying that no single pay component can explain the standardization by itself. The standardization is also robust to distinguishing between restricted and performance-based stock, and to including the change in pension value and nonqualified deferred compensation earnings as an additional pay component.[10]

Using a similar methodology, I also find increasing standardization in companies' metrics for CEO performance. To evaluate this standardization, I use the ISS Incentive Lab database. Specifically, I identify all performance metric types used in each CEO's contract. The database identifies 32 different measures.[11] Accordingly, for each firm-year observation, I create a 32-element vector in which each element takes the value of 1 if the CEO contract uses that specific performance metric and 0 otherwise. Using this

[10] Internet Appendix IA4 details all the results reported in this section. Internet Appendix IA5 reports similar trends for CFOs and for other executives that are neither CEOs nor CFOs.

[11] The metrics are: Stock Price, Accounting (Balance Sheet Related, ROC, Book Value, Working Capital, Sales Contracts), Environment (Climate Change and Energy Use, Environmental Protection), Social (CSR, Society and Human Rights), Labor (Staff Health and Safety, Staff Relations, Engagement And Training, and Labor Conditions in Supply Chain), Sales (Sales, Same Store Sales), Customer (Customer and Product Responsibility, Customer Satisfaction), Profit (Profit Margin, Gross Profit), Cashflow, EBIT, EBITDA, EPS, Individual, Operating Income, Earnings, Business Unit, Debt Related, Diversity, EVA, FFO, Gross Revenues, ROA, ROE, ROIC, ROI, Non-Financial, Operational, Net Income, TSR, NOI, Vague, and Other (other, Cost Reduction, FDA Approval, IPO of Subsidiary, Resource Use, and Discretionary).

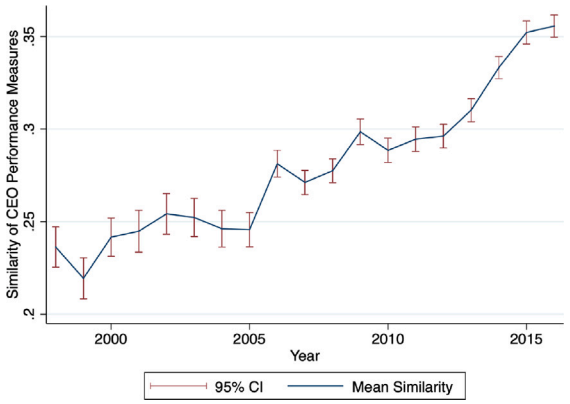


Fig. 2. Average cosine similarity of performance measures in CEO compensation.
The figure shows the time-series of the mean cosine similarity of a vector with the performance measures used in CEO compensation plans.

Table 2
Cosine similarity of performance metrics in CEO compensation plans.

	(1) Perf Metrics Similarity in t	(2) CEO Comp Similarity in t	(3) Perf Metrics (weighted) Similarity in t	(4) CEO Comp Similarity in t
Trend	0.007***		0.003***	
	(0.000)		(0.001)	
Performance metrics similarity in t		0.050***		
		(0.015)		
Performance metrics (weighted) similarity in t				0.043**
				(0.021)
Observations	7236	7069	1277	1277
R-squared	0.096	0.176	0.007	0.184
Firm FE	YES	YES	YES	YES
Year FE		YES		YES

Column (1) presents the results of the OLS panel regression of the cosine similarity of performance metrics on a time trend. Column (2) presents the results of regressing the baseline pay structure similarity (vector with salary, bonus, stock, option, non-equity incentives, and other compensation) on the performance metrics similarity. Columns (3) and (4) are similar to (1) and (2) but weight each performance metric by how much compensation is tied to it (based on the target value). Standard errors are clustered by firm and reported in parentheses. Significance levels are indicated: *=10%, **=5%, ***=1%.

vector, I estimate the cosine similarity of each pair of firms, and then calculate the average similarity of each firm with respect to all other firms in the sample in each year, as described in Section 3.1.

I first note that the number of different metrics used by companies has increased over time. This is in line with Albuquerque et al. (2024), who report that CEO compensation contracts have become more complex in recent years. Indeed, their complexity measure is based, among other things, on the number of performance metrics included in a compensation package. I find that firms are not just using more metrics; they are adopting these numerous metrics similarly.[12] Indeed, Fig. 2 presents a time series plot of the average cosine similarity of the performance-metrics vector, showing a convergence similar to the pay structure similarity.

More formally, Column (1) in Table 2 shows the results of a regression of performance-metrics similarity on a time trend, and the time trend coefficient is positive and statistically significant. Companies are not only standardizing their compensation structures but also the goals they set for their CEOs. Furthermore, Column (2) shows that the performance-measure similarity positively correlates with the pay structure similarity. This correlation suggests that standardizing trends simultaneously affect compensation structure and performance metrics. Columns (3) and (4) show consistent results when weighting each performance metric by how much compensation is tied to it (based on the target value).[13]

Exploring further, I also examine the link between pay structure similarity and the relationship between the different components of the pay packet. Even though each pay component aims to solve specific types of incentive issues, I broadly categorize them into two groups: turnover risk (or talent retention) and behavior-inducing. Pay components in the same category can be considered substitutes, while those in different categories can be considered complements. In particular, I consider salary, restricted stock, other compensation, and pensions as **turnover risk components**, and bonus, performance-based stock, options, and non-equity incentives plan as **behavior-inducing components**.

[12] In the Internet Appendix IA3, I show that all my main results are robust to controlling for the complexity measure suggested by Albuquerque et al. (2024).
[13] The number of observations drops significantly in this final analysis, due to missing information about how much compensation is tied to each performance metric.

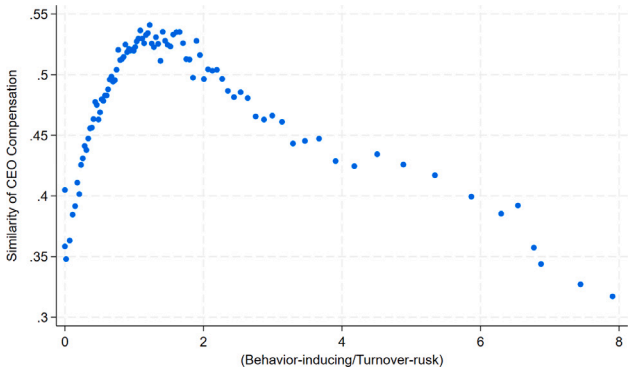


Fig. 3. Pay structure similarity, Turnover risk and Behavior-inducing incentives.
This figure presents a binned scatter plot of pay structure similarity and the ratio between the turnover-risk components and the behavior-inducing components. Each dot shows the average pay structure similarity for a given level of turnover-risk/behavior-inducing ratio in 100 equal-sized bins. The vector of compensation used to calculate the cosine similarity includes salary, bonus, performance-based stock awards, restricted stock awards, stock options, non-equity incentives, other compensation, and pension. Turnover-risk components include salary, restricted stock awards, other compensation, and pension. Behavior-inducing components include bonus, performance-based stock awards, stock options, and non-equity incentives.

Based on this categorization, I create a ratio between the two groups and examine its association with pay structure similarity. As Fig. 3 shows, there is an inverse U-shape relationship. On average, firms with more standardized pay structures tend to have a more balanced mix of turnover risk and behavior-inducing incentives. Since it is not clear what the optimal balance between the two types of incentives is, and also because this optimal balance is unlikely to be the same for every firm, this relationship enhances the relevance of exploring the consequences of pay structure standardization, as I do in Section 6.

Internet Appendix IA4 presents a set of additional robustness tests. For example, one limitation of my pay structure similarity measure is that it captures realizations of pay, and it is possible that contracts are converging in their outcomes but not in contingencies within the respective contracts. Using the ISS Incentive Lab database, I find that this is not the case: contracts are also converging in the type of awards they use before pay realization. Another concern might be that, because part of the compensation is linked to performance, the standardization in pay realizations may be a consequence of a general increase in market performance. However, this is unlikely to be the case, as the correlation between the firm's stock return and the market return (beta) does not affect either the pay structure similarity level or the standardization speed.

Overall, I find that pay structures have indeed become more similar over time. This standardization is economically large, robust to different specifications, unlikely to be explained by firms' characteristics or industry-specific forces, and is consistent with a one-size-fits-all trend.

5. Underlying economic forces

5.1. The influence of institutional investors

To understand the potential causes of this standardization, I first examine whether institutional investors contribute to the standardization of executive pay structure (Hypothesis 2a). I regress pay structure similarity on the ratio of shares owned by institutional investors and find a positive correlation.[14] In particular, Column (1) in Table 3 shows that as a firm increases its proportion of institutional ownership, its average pay structure similarity also increases. Moreover, Column (2) shows a positive and significant interaction between this effect and a time trend, meaning that the positive influence of institutional investors on pay structure similarity has become significantly stronger over time.

I also examine whether this effect is stronger when institutional investors are more likely to engage with the firm's management and influence its corporate policies (Hypothesis 2b). Specifically, I use the firm-level measure of institutional investors' incentives to be engaged shareholders developed by Lewellen and Lewellen (2022). They measure an institution's incentive to be an active shareholder as its payoff sensitivity to the firm's value. Using their measure, I create a dummy equal to one if the firm is above the median and interact this dummy with the proportion of institutional ownership. Column (3) shows that this interaction term is positive and significant, implying that the positive association between institutional ownership and pay structure similarity is stronger when institutional investors have higher incentives to engage with the focal firm.

In a similar test, I use the firm-level shareholder "distraction" measure developed by Kempf et al. (2017) (KMS).[15] They show that "distracted" institutional investors are less involved in the focal firm's corporate governance. Thus, if institutional investors

[14] The data on institutional ownership comes from the Thomson Reuters Institutional (13F) Holdings database. Following Lewellen (2011) and Lewellen and Lewellen (2022), I set institutional ownership to 100% of shares outstanding in the small number of cases in which institutions appear to hold more than 100% of the firm. All the results reported in this analysis are robust to using the scraped F13 data from Backus et al. (2021).

[15] I thank the authors for making this dataset publicly available.

Table 3
Institutional investors and CEO pay structure similarity.

	CEO Comp Similarity in t			
	(1)	(2)	(3)	(4)
Institutional ownership in t−1	0.070***	0.040***	0.034***	0.063**
	(0.007)	(0.010)	(0.010)	(0.025)
(Institutional ownership in t−1)(Trend)		0.003***		
		(0.001)		
Trend		0.008***		
		(0.001)		
(Institutional ownership in t−1)(High LL incentives in t−1)			0.021**	
			(0.010)	
(High LL incentives in t−1)			−0.019**	
			(0.008)	
(Institutional ownership in t−1)(Distraction in t−1)				−0.140**
				(0.061)
Distraction in t−1				0.016
				(0.139)
Observations	22,581	22,581	18,712	4262
R-squared	0.158	0.154	0.158	0.092
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Column (1) presents the results of the OLS panel regression of similarity on the ratio of shares owned by institutional investors. Column (2) includes a time trend and its interaction with the institutional ownership ratio. Column (3) includes the measure of institutional investors' incentives to engage with management developed by Lewellen (2011). Column (4) includes the measure of institutional investors' distraction developed by Kempf et al. (2017). All variables are winsorized at the 1% and 99% levels. Standard errors are clustered by firm and reported in parentheses. Significance levels are indicated: *=10%, **=5%, ***=1%.

are behind the increase in pay structure similarity that I document, their effect should be weaker when they are more distracted. To test this idea, I regress pay structure similarity on the ratio of shares owned by institutional investors and its interaction with KMS shareholder distraction.[16] Column (4) shows that the interaction term is negative and significant, meaning that even though institutional investors increase pay structure similarity, this effect is weaker when they are less involved in the focal firm's governance policies.

Overall, the analysis in this section suggests that institutional investors play a relevant role in the standardization of compensation structure. However, institutional influence is endogenous, and the positive correlations described above do not necessarily imply that institutional investors are actively pushing toward standardizing contracts. For example, it could be possible that they prefer to invest in companies with more standardized compensation plans, but they do not directly influence them to be more standardized. It could also be that omitted variables (e.g., corporate culture or information disclosure) simultaneously increase both institutional ownership and compensation structure similarity.

I address these endogeneity concerns by using a quasi-natural experiment that exogenously increased institutional investors' influence on executive compensation design without affecting other variables such as compensation disclosure, corporate culture, level of institutional ownership, or the usual firm characteristics (i.e., size, age, profitability).

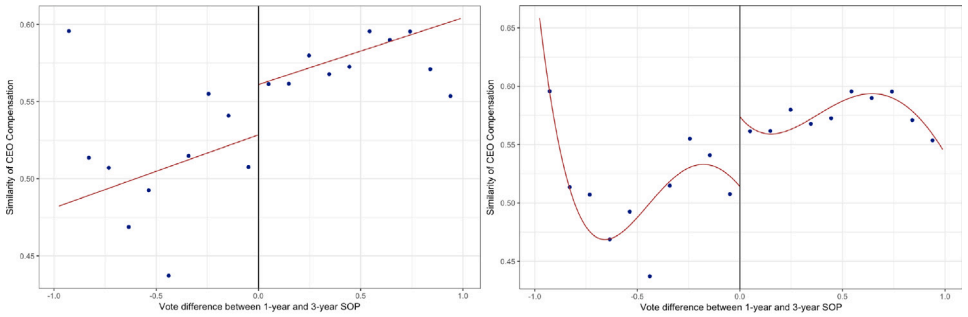
5.1.1. Evidence from the frequency of mandatory say-on-pay

Say-on-Pay is the practice of publicly traded companies submitting their executive compensation plans to a shareholder vote. In the first annual shareholders' meeting after the adoption of mandatory SOP in 2011 — and every six years after that — shareholders voted on the frequency of SOP voting, choosing between one-year, two-year, and three-year gaps between votes.[17] I use this frequency vote as the main instrument for increasing the influence of institutional investors on the design of compensation plans: firms with a higher SOP frequency are more frequently exposed to this influence than firms with a lower frequency. Thus, I use the one-year SOP as a treatment that increases shareholders' influence (compared to the three-year SOP).

The identifying assumption for this analysis is that treated firms (one-year SOP) and control firms (three-year SOP) only differ in the frequency of SOP sessions chosen by the shareholders in the 2011 proxy voting. However, shareholders' preferences regarding the SOP frequency of a particular firm can be correlated with other firm characteristics. To overcome this concern, I restrict the analysis to firms that had high levels of voting support for both one-year and three-year SOP frequency, suggesting that treated and control firms are similar regarding their shareholders' voting preferences. Specifically, I use the shareholders' votes on SOP frequency to run a sharp regression discontinuity estimation. The intuition of this identification strategy is that firms in which one-year-SOP won vs. three-year-SOP by a narrow margin can be a proper counterfactual for those firms with a narrow three-year SOP victory over a one-year SOP. In other words, around the zero threshold, the victory of one-year SOP over three-year SOP is as if the groups were randomly assigned, and the distinction between groups is unlikely to be related to firm characteristics or omitted variables.

[16] The measure is only available up to 2010. Thus, the sample for this analysis is significantly smaller than in the baseline analysis.

[17] Even though this vote is non-binding, 99.06% of the sample firms follow the result of the voting.



(a) Local linear regression (b) local polynomial of order 4

Fig. 4. Frequency of Say-on-Pay: RDD analysis.
The figure graphically represents the discontinuous jump in the level of CEO pay structure similarity when a firm has a higher frequency of Say-on-Pay (SOP). The vertical axis shows the average cosine-similarity of compensation in the next period. The horizontal axis shows the margin of victory for the one-year SOP frequency (defined as the vote share of the one-year SOP minus the vote share of the three-year SOP). The value of this variable goes from −1 to +1, with positive values indicating the victory of the one-year SOP frequency. At the zero threshold, the frequency of SOP sharply changes from three to one. The plot also presents a global polynomial fit and local sample means. The local means are created by choosing the disjoint intervals or bins of the score. The number and length of the bins were chosen by a data-driven model, following (Calonico et al., 2017). Figure (a) shows a linear regression, and Figure (b) shows a local polynomial regression of order 4.

Thus, I create a variable that measures the one-year-SOP margin of victory, defined as the vote share of the one-year-SOP minus the vote share of the three-year-SOP.[18] The value of this variable goes from −1 to +1, with positive values meaning a one-year SOP victory. At the zero threshold, the frequency of SOP sharply changes from three to one. I estimate a local polynomial Regression Discontinuity, following Calonico et al. (2014), Calonico et al. (2017, 2019).[19] The RD estimate is defined as $E[Similarity_i(1) - Similarity_i(0)|x = 0]$. $Similarity_i(1)$ is the pay structure similarity of firm i with a one-year-SOP margin of victory greater than zero, $Similarity_i(0)$ is the pay structure similarity of firm i with a one-year-SOP margin of victory lower than zero, and $x = 0$ means a margin of victory equal to zero.

In Panel A of Table 4, Column (1) reports the RDD estimation using the one-year frequency of SOP margin of victory and the subsequent pay structure similarity in the next period. The estimated coefficient has a magnitude of 4.7 basis points and is statistically significant at the 2% confidence level. This value corresponds to an increase of almost 10% in pay structure similarity when a firm jumps from a one-year frequency of SOP to a three-year frequency. Column (2) reports similar results, using the average pay structure similarity of the following three years as the dependent variable. Panel B shows that the results are robust to using other compensation vectors, such as including pensions, distinguishing restricted and performance-based stocks, and measuring similarity only among industry peers. Fig. 4 presents a graphical representation of this effect.[20]

An essential assumption of this regression discontinuity analysis is that firms cannot precisely manipulate the votes they receive. Hence, the density distribution of firms should not drastically change when the one-year-SOP margin of victory switches from negative to positive. A histogram showing the vote difference between a one-year and three-year-SOP, presented in Fig. 5, supports this assumption. In the formal test presented in Panel C, the local polynomial density estimators proposed by Cattaneo et al. (2015) show no evidence of a density discontinuity at the cutoff.[21] Another underlying assumption of an RDD is that near the cutoff, treated units are similar to control units. Therefore, using the same RDD specification, I test if firms below and above the cutoff differ in size, age, profitability, and institutional ownership. Panel D of Table 4 presents the results of these tests, showing no significant differences.

An external validity concern about any RDD is whether these effects can be extrapolated to those firms with greater vote differences. In an analysis reported in Internet Appendix IA6, I find a coefficient of similar magnitude when I run a difference-in-differences estimation that considers the whole sample of firms. This similar magnitude in the coefficient enhances the external validity of the RDD estimation.

[18] The two-year vote in the sample was immaterial (only three firms).

[19] Since the object of interest is a conditional expectation, I follow the literature and use a polynomial of order one for the estimation. The bandwidth is chosen by a data-driven model that minimizes an approximation to the asymptotic mean squared error (MSE) of the RD point estimator. The MSE of an estimator is the sum of its bias squared plus its variance. Also, following the literature, my estimation uses a triangular kernel function to weight the observations, giving more weight to an observation closer to the cutoff.

[20] The plot presents the predicted values from two fourth-order polynomials of pay structure similarity on the voting difference, fitted separately above and below the cutoff. The local means are created by choosing disjoint intervals or bins of the score, calculating the mean of the similarity within each bin, and then plotting the binned outcomes against the midpoint of the bin. The number and length of the bins were chosen by a data-driven model, following (Calonico et al., 2017).

[21] This test estimates the density of observations near the cutoff, separately for observations above and below the cutoff. The null hypothesis is that the density of the running variable is continuous at the cutoff.

Table 4
Effects of the frequency of Say-on-Pay on CEO pay structure similarity: regression discontinuity design.

Panel A: CEO pay structure similarity

	(1) CEO Comp Sim in t+1	(2) Avg CEO Comp Sim (t+1, t+3)
Local average effect of treatment at vote difference equal zero	0.047**	0.044***
	(0.020)	(0.017)
Observations	1350	1204

Panel B: Alternative measures of similarity

	(1) Pension	(2) Rest stock	(3) Exc SIC3
Local average effect of treatment at vote difference equal zero	0.036*	0.023*	0.061**
	(0.019)	(0.014)	(0.026)
Observations	1350	1334	1335

Panel C: RD manipulation test using local polynomial density estimation

Method	T	P>T
Robust	−0.0429	0.9658
Observations	1350	

Panel D: Covariates

	(1) Log asset	(2) Log age	(3) ROA	(4) Inst Own
Local average effect of treatment at vote difference equal zero	0.264	0.282	−0.010	−0.034
	(0.268)	(0.240)	(0.032)	(0.034)
Observations	1347	1350	1347	1263

This table displays the estimated discontinuities of firm characteristics at the threshold of zero margin of victory for the one-year frequency of Say-on-Pay. Panel A uses CEO pay structure similarity in t+1 as the dependent variable. Panel B uses pay structure similarity using different compensation vectors. Column (1) includes pensions, Column (2) distinguishes between restricted stocks and performance-based stock, and Column (3) excludes companies in the same industry (SIC-3). Panel C uses size, age, profitability, and institutional ownership as the dependent variables. Robust standard errors are clustered by industry and reported in parentheses. Significance levels are indicated: *=10%, **=5%, ***=1%. Panel B presents the result of the local polynomial density test proposed by Cattaneo et al. (2015).

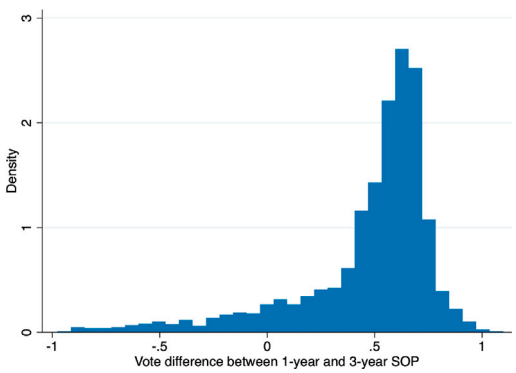


Fig. 5. Histogram of the vote differences between 1-year and 3-year Say-on-Pay.
The figure shows a histogram of the vote differences between a one-year and three-year Say-on-Pay frequency.

5.1.2. Proxy advisory firms

As I hypothesized in Hypothesis 2c, institutional investors might be fostering a one-size-fits-all trend due to proxy advisors' recommendations. I now proceed to test this hypothesis. Unfortunately, since I do not observe the information flow between proxy advisors and institutional investors, I cannot directly test this hypothesis. However, I do track the recommendations when voting in a proxy meeting. Four tests on this dataset suggest that proxy advisors' influence on institutional investors plays a role in explaining the standardization of compensation structures.

In the first test, I create a dummy variable that equals one if the firm received a negative SOP recommendation from ISS. Then, I regress that dummy variable on pay structure similarity, lagged by one period. Panel A of Table 5 presents the results of this regression and shows that firms with less similar compensation packages are more likely to receive a negative SOP recommendation from ISS in the next year. This finding is robust to controlling for firm characteristics and to including firm and year fixed effects. It suggests that ISS punishes firms that have a compensation package that does not look like the others.

Second, I regress pay structure similarity on a dummy variable that equals one if the firm received a negative recommendation from ISS in the last two years. As reported in Panel B of Table 5, similarity increases when the firm received a negative SOP recommendation from ISS in the last SOP vote. This finding is robust to controlling for firm characteristics and including firm and year fixed effects. These results suggest that firms respond to negative ISS recommendations by making their compensation packages more similar to those at other firms.

In the third exercise, I follow (Denis et al., 2020) and Dey et al. (2023) and exploit the level of SOP voting opposition where ISS increases its scrutiny on the firm's compensation plans. In particular, when a firm's SOP voting support falls below 70%, ISS conducts a qualitative review of the firm's shareholder engagement efforts and responsiveness to concerns before the next annual meeting.[22]. ISS also provides case-by-case voting recommendations on compensation committee members if a company's prior year SOP vote outcome was below that threshold. If the company does not demonstrate adequate responsiveness, ISS will generally recommend a vote against the SOP proposal and the compensation committee members in the next proxy meeting. To test whether this increase in ISS scrutiny affects pay structure similarity, I regress pay structure similarity on a dummy that equals one if SOP voting support is below 70% and zero if it is above 70%. In Panel C of Table 5, Column (1) presents the result of this estimation. The coefficient of the dummy is positive and significant, indicating that firms experiencing an increase in ISS scrutiny increase their pay structure similarity in the next year.

For a cleaner identification — and following (Dey et al., 2023) — I run a second analysis in which I restrict the sample to those firms with voting support between 67.5% and 72.5%. This specification relies on the assumption that, around the 70% threshold, receiving ISS treatment is as good as random since firms cannot manipulate the SOP vote. Column (2) presents the result of this regression. Again, the dummy coefficient is positive and highly significant, with a magnitude similar to the one estimated using the whole sample of firms. All these regressions include firm and year fixed effects and control for firm size, age, and profitability. This analysis shows that when firms receive higher scrutiny from ISS due to a poor SOP outcome, they tend to standardize their compensation plans. This evidence supports the hypothesis that ISS's influence explains part of the standardization of executives' compensation structure.

Finally, I explore whether compensation plans are converging to what proxy advisory firms believe is optimal. Because I do not know what the proxy advisory firms' preferred compensation vector is, I create a simulated vector that mimics the implicitly preferred vector behind ISS's recommendations on SOP. Specifically, I randomly generate 1,000,000 compensation vectors in which each element is generated by a uniform distribution between zero and one. I standardize the vector such that the sum of all elements equals one. I then estimate Eq. (4) using each of these 1,000,000 vectors and pick the vector that generates the highest adjusted R^2.

$$ISS\_favor_{it} = \beta_0 + \sum_k \left[\beta_{1k} \max(v_{it}^k - \hat{v}^k, 0) + \beta_{2k} \min(v_{it}^k - \hat{v}^k, 0)\right] + \epsilon_{it} \tag{4}$$

where ISS_favor_{it} is a dummy variable equal to one if the firm received a positive SOP recommendation from ISS, v_{it}^k is element k of compensation vector v of firm i in year t, and $\hat{v}^k$ is the simulated compensation element k preferred by ISS. The intuition behind this equation is that the probability of receiving a positive ISS recommendation on SOP depends on how close each element of the firm's compensation package is to ISS's preferred compensation structure. Appendix IA7 reports the simulated vector $\hat{v}$ that maximizes R^2 of Eq. (4).

To estimate this vector, I use all ISS recommendations on SOP after 2011 (the period with mandatory SOP). I then calculate the cosine similarity of each firm's compensation package to this simulated ISS vector, and find that firms' compensation structures converge to the simulated vector that ISS most recommends voting in favor of. Panel D of Table 5 reports these results in a formal regression (please see Internet Appendix IA7 for a time-series plot of the same analysis).

5.2. Compensation disclosure

Another potential cause of pay structure standardization is the increased compensation disclosure observed in the last few decades. The idea is that increases in available information about other firms' compensation can facilitate mimicry, potentially making compensation structures more similar between firms (Hypothesis 3a). The main obstacle to testing this hypothesis directly

[22] Dey et al. (2023) show that firms receiving this ISS treatment exhibit a swift and substantive increase in shareholder engagement, which validates the first stage of this instrument.

Table 5
CEO pay structure similarity and the influence of proxy advisory firms.

Panel A: ISS negative recommendations in t	(1)	(2)		
CEO Comp Similarity in t−1	−0.095***	−0.095***		
	(0.027)	(0.027)		
Observations	16,218	15,969		
R-squared	0.002	0.005		
Controls		YES		
Firm FE	YES	YES		
Year FE	YES	YES		

Panel B: CEO pay structure similarity in t	(1)	(2)	(3)	(4)
ISS against in t−1	0.009**	0.009**		
	(0.004)	(0.004)		
ISS against in t−1 or in t−2			0.011***	0.010***
			(0.004)	(0.004)
Observations	14,456	14,299	14,836	14,583
R-squared	0.069	0.072	0.074	0.076
Controls		YES		YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel C: Review of engagement activities by ISS

	CEO Comp Similarity in t	
	Whole sample	$0.675 \leq SOP < 0.725$
Review of engagement activities by ISS in t−1	0.012**	0.099***
	(0.005)	(0.030)
Observations	11,582	226
R-squared	0.058	0.466
Controls	YES	YES
Firm FE	YES	YES
Year FE	YES	YES

Panel D: Similarity to ISS simulated preferred compensation vector

	ISS in Favor		
Trend	0.007***	0.006***	0.007***
	(0.000)	(0.000)	(0.000)
Observations	28,062	26,685	28,062
R-squared	0.026	0.024	0.026
Industry FE		YES	
Firm FE			YES

Panel A displays the results of the OLS panel regression of a dummy variable that equals one if the firm received a negative ISS recommendation in the subsequent year on the measure of similarity. Panel B presents the results of the OLS panel regression of similarity on a dummy variable that equals one if the firm received a negative ISS recommendation in previous years. Columns (1) and (2) consider a negative recommendation in the last year, whereas Columns (3) and (4) consider a negative recommendation in the last two years. All regressions include firm and year fixed effects. Controls include log of assets in t−1, log of firm age in t−1, and profitability in t−1. Panel C presents the results of regressing pay structure similarity on a dummy variable equal to one if the last SOP support (votes in favor/(votes in favor + votes against)) is below 70% and zero if it is above 70%. Panel D displays the results of the OLS panel regression of the cosine similarity compensation package to a simulated ISS vector on a time trend. In Column (2), the sample is restricted to SOP support between 67.5% and 72.5%. All variables are winsorized at the 1%–99% level. Standard errors are clustered by firm and reported in parentheses. Significance levels are indicated: *=10%, **=5%, ***=1%.

is that information flows between firms are difficult to observe. Thus, I first use a set of measures that correlate with firms learning from peers. In particular, I find that two companies increase their pay structure similarity when they become part of the same

benchmarking compensation group (the peers that each firm more closely observes at the moment it defines its compensation plans), when they share a common director,[23] when they have headquarters in the same zip code,[24] and when they have the same compensation consultant. Internet Appendix IA8 presents a detailed description of these results.

Overall, these tests suggest that companies tend to mimic the compensation plans of other firms. However, none of them directly capture information disclosure. In the next section, I thus examine a direct shock to compensation disclosure.

5.2.1. The 2006 CD&A rules on disclosure of executive compensation

I follow (Gipper, 2021) and use the SEC's 2006 introduction of the Compensation Discussion and Analysis (CD&A) rules as a quasi-natural experiment that exogenously increased the available information about other firms' compensation packages. Among other things, the new rules required firms to publish a Compensation Discussion and Analysis, a narrative description of each of the compensation components reported in the summary pay table (salary, bonus, stock, options, non-equity incentive plans, and other compensation). The new rules explicitly said that companies must discuss "*what the compensation program is designed to reward,*" "*why [. . .] pay each element,*" and "*how does the company determine the amount for each element.*"

This regulation is an ideal setting to test Hypothesis 3a since its main goal was to facilitate comparisons across firms, as the Final Rule explicitly points out: *"These amendments will better enable investors to make comparisons both within and across companies. A presentation facilitating the comparability of different elements of compensation in different companies should make it easier for investors to analyze both the manner of compensation across companies and the quality of compensation disclosure across companies".*

To identify a causal link, I follow (Gipper, 2021) and exploit exogenous variation in the timing of the rule, which differentially came into force depending on the fiscal year-end date of the firm. Specifically, the mandate requires disclosures in the proxy statement covering the fiscal year ending on or after December 15, 2006. The timing allows for a comparison of manager pay at firms with and without the disclosure in the same fiscal year. Firms with a December closing in 2006 released a CD&A about their 2006 compensation plan, whereas firms with an end date in Sept–Nov did not release a CD&A about their 2006 compensation.[25] All firms could see the CD&A of firms in the former group, and if there are learning effects, they could incorporate this information in their compensation plans for the next year. This could not happen for the 2006 compensation of the firms with an end date in Sept–Nov. Thus, I expect that the average compensation plans in 2007 will be more similar to the 2006 compensation plans of firms affected by the CD&A rule in 2006 than to the 2006 compensation plans of firms not affected by the rule. For any other year of CD&A, I should not observe any difference in the compensation similarities because all firms reported CD&A in those other years.

Thus, I ran the following test. First, I define treated firms as those with December closings in 2006, and control firms as those with Sept–Nov closings in 2006. I then identify the compensation structure of each group of firms in 2006 (the year covered by the first CD&A). After that, for each firm in my sample, I calculate the similarity of its 2007 compensation to the 2006 compensation of each group. I thus create two similarities for each firm in 2007: (A) the average similarity to the 2006 compensation plan of firms with a year-end in December, and (B) the average similarity to the 2006 compensation plan of firms with a year-end in September–November. Since similarity (A) includes CD&A and similarity (B) does not, I expect the former to be higher. Thus, in my final step, I test whether the difference between these two similarities is significantly greater than zero.

Of course, this difference should only exist regarding the compensation in 2006 because, in all other years, there is no difference in disclosure between firms with different fiscal year-end dates. Thus, as a placebo test, I repeat the exercise but use the compensation of each group in 2007 as the benchmark. I do the same for 2008, 2009, etc. Since, in all these years, all firms reported CD&A, there should not be any differences between the two similarities.

Because the new rules also changed the decomposition of compensation components reported by each company in the compensation table, to run this test I need to build a new compensation vector that is comparable between firms using the new rules (treated firms) and those using the old rules (control firms). The main difference between the two regimes is the definition of bonus and long-term incentives. Some of the compensation considered "Bonus" under the 2006 rules was considered "Long-term incentives" under the previous rules. Likewise, some of the compensation considered "Non-equity" under the 2006 rules was considered "bonus" under the previous rules. In order to make both regimes as similar as possible, I follow (Murphy, 2013) and create a component equal to "Bonus" plus "Long-term incentives" before 2006 and "Bonus" plus "Non-equity" after 2006. Thus, the compensation similarity used in the test will be based on the following vector: salary, bonus + Long-term incentives or Non-equity incentive plans, stock awards, options, and other compensation.

Fig. 6 plots the results of the analysis. I find that compensation plans in 2007 are significantly more similar to the 2006 compensation plan of firms with a December end-date (those forced to report a CD&A that year) than to the 2006 compensation plan of firms with a Sept–Nov end date, with a t-stat of 26.45. Importantly, this effect disappears for the other years of CD&A, suggesting that it is due to the CD&A disclosure and not to a seasonality effect, since for the rest of the years, when all firms reported CD&A, there is no difference in structure similarity.

The evidence reported in this section suggests that information disclosure facilitates mimicking other firms' compensation plans and increases structural similarity across firms. However, in the indirect tests, the effects do not change over time, and the CD&A analysis does not allow me to test changes over time. Thus, even though information disclosure presents an important factor explaining standardization, I cannot infer that it also explains an increase in this standardization over time.

[23] There exists evidence that overlapping directors transmit information from one board to the other, especially regarding corporate governance practices (e.g., Bouwman, 2011, Foroughi et al., 2022) and executive compensation (Fernandes et al., 2013).

[24] Many studies show the existence of peer effects when companies are geographically close (e.g., Jaffe et al., 1993, Greenstone et al., 2010).

[25] Please see Gipper (2021) for a detailed description of the identifying strategy.

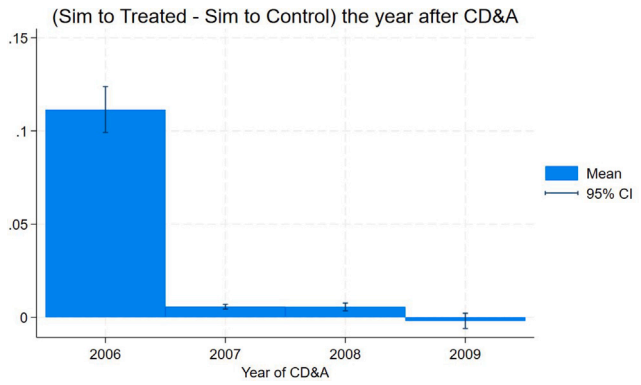


Fig. 6. Effect of CD&A disclosure.
To build this figure, I define *treated* as the 2006 compensation plans for firms with a December ending date, and *control* as the 2006 compensation plans for firms with a September–November ending date. The x-axis presents the year covered by a given CD&A. The y-axis shows the average cosine similarity of all firms to the compensation plan of the treated group, minus the average cosine similarity to the control firms for the year after each CD&A. The compensation vector used to calculate the cosine similarity includes salary, (bonus + long-term incentive plans if before 2006; and bonus + non-equity incentives if after 2006), stock awards, stock options, and other compensation.

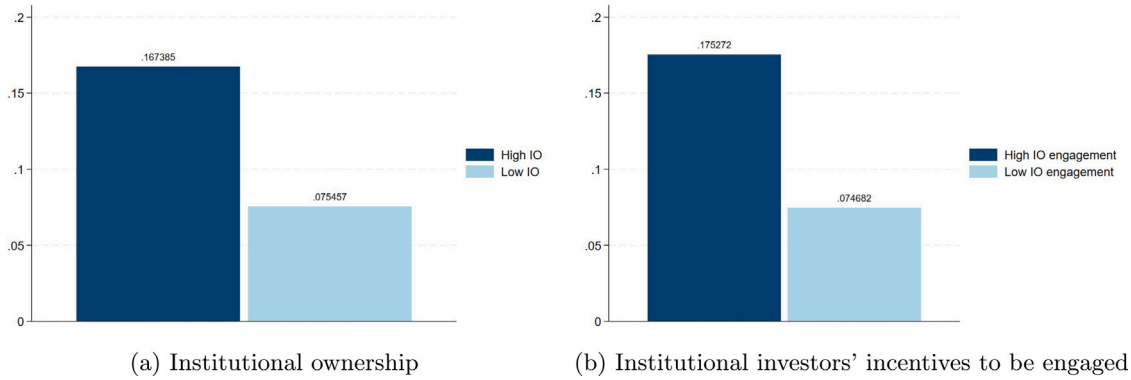


Fig. 7. CD&A disclosure and institutional investor ownership.
This figure compares the average cosine similarity of all firms' compensation in 2007 to the compensation plan of the treated firms in 2006, minus the average cosine similarity of all firms' compensation in 2007 to the compensation plan of the control firms in 2006. Panel (a) distinguishes between companies with institutional ownership above and below the median in 2007, and Panel (b) distinguishes between companies with institutional investors' incentives to engage with management above and below the median in 2006 (the measure of engagement incentives comes from Lewellen and Lewellen, 2022). The compensation vector used to calculate the cosine similarity includes salary, (bonus + long-term incentive plans if before 2006; and bonus + non-equity incentives if after 2006), stock awards, stock options, and other compensation.

5.2.2. Expanded compensation disclosure and institutional investors

Given the previous evidence that institutional investors influence firms to have more standardized compensation plans, the disclosure effect may well be stronger when there is a higher presence of institutional investors (Hypothesis 3b). Expanded compensation disclosure allows greater scrutiny from institutional investors since they can more easily compare different compensation elements in different companies. I thus analyze whether the effects of the CD&A-mandated disclosure are stronger when there is more institutional ownership in the focal firm.

In particular, Panel (a) in Fig. 7 presents the mean of the difference in similarities described in the previous section, for companies with institutional ownership above and below the median in 2007. Panel (b) does the same for companies with institutional investors' incentives to engage with management above and below the median in 2007 (Lewellen and Lewellen, 2022). In both cases, I find that the effect of the CD&A-mandated disclosure on pay structure similarity is significantly larger when the firm has more institutional investor ownership and also when those investors have higher incentives to influence the firm's management (with t-stat values of 7.58 and 6.93, respectively). These results suggest that by facilitating comparison across firms, compensation disclosure also enhances the influence of institutional investors toward standardization of compensation plans.

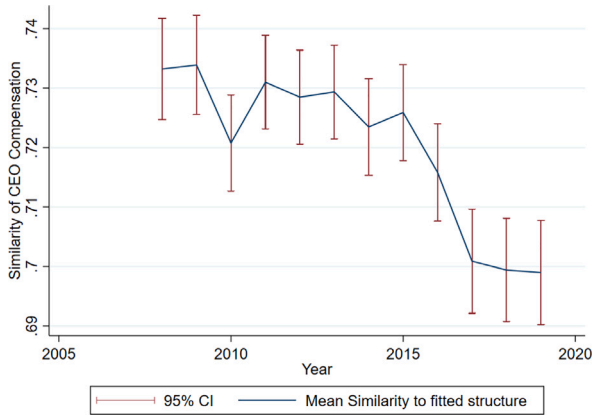


Fig. 8. Average CEO pay structure similarity to fitted structure based on firm characteristics.
The figure shows the time-series plot of the average cosine similarity of each firm's compensation structure (salary, bonus, stock, option, non-equity, and other) to a fitted vector, using coefficients estimated in the sample period between 2006 and year t−1.

6. Compensation structure standardization and firm value

I now examine the consequences of the standardization of CEO compensation on firm value. Since I do not observe each firm's optimal compensation structure, I cannot address this question directly. Acknowledging this empirical limitation, I take two indirect approaches.

In the first approach, I examine whether standardization leads to a compensation structure that the firms' characteristics would predict. Specifically, I regress each element of the compensation vector v_{it} (see Eq. (1)) on firm characteristics for the sample period prior to each year t. Then, I use the estimated coefficient of each firm characteristic to create a fitted vector for each year t. Finally, I calculate each firm's compensation package's cosine similarity to this fitted vector for every year t.[26]

Fig. 8 shows a time-series plot of this similarity. I find a downward slope, suggesting that every year, compensation structures move away from what firms' fundamentals would predict. Unless the link between firms' fundamentals and compensation plans has changed abruptly in recent years, this separation implies that either optimal contracts have changed or the current standardization is moving pay packages away from the optimal design.

In a second approach, I examine whether standardization is associated with pay-performance sensitivity and market valuation. In particular, I analyze within-firm changes in pay structure similarity and their impact on ex-post delta, firm value, and shareholders' returns, as Eq. (5) shows.

$$\text{DEP}_{it} = \alpha_0 + \beta_1 \text{SIMILARITY}_{it-1} + \ \delta_1 \ \text{CONTROLS}_{it-1} + \mu_i + \gamma_t + \epsilon_{it} \tag{5}$$

I obtain measures of delta from Coles et al. (2006). Delta is measured as the dollar change in the CEO's wealth (i.e., the value of the CEO's stock and options portfolio) associated with a 1% change in the firm's stock price (in $000s). I measure firm value using Tobin's Q. To measure shareholders' returns, I calculate the cumulative abnormal daily returns (CAR) during the calendar year, using a one-year window (252 days). These regressions include firm fixed effects and, therefore, compare changes relative to the same firm in different moments of time, controlling for any time-invariant omitted variables. They also include year fixed effects and, therefore, control for anything that affects all firms in the same year (e.g., macroeconomic conditions).

Column (1) in Panel A of Table 6 presents the result of this estimation using delta as the dependent variable. When a firm experiences increases in pay structure similarity, that same firm's CEO pay exhibits less sensitivity to firm performance (delta). In line with these findings, Column (2) shows that a firm that increases its ex-ante similarity also reduces its ex-post market value. Columns (3) to (6) present consistent results for CARs. Column (3) calculates CAR using abnormal returns defined in excess of the CRSP Value-weighted market return (assuming a market beta of 1), Column (4) uses the CAPM model, Column (5) uses the Fama–French Three Factor Model, and Column (6) uses the Fama–French Plus Momentum model. Overall, all the estimations show that when a firm increases its pay structure similarity in a given year, it experiences lower pay-performance sensitivity, lower returns, and lower market valuations in the following year. These findings suggest that, on average, the standardization of compensation structure negatively affects firm value (Hypothesis 4b).

Exploring further, I find that these negative effects are mainly driven by firms in which institutional investors have lower payoff-to-firm-value sensitivity (Hypothesis 4c). In Panel B, I include an interaction term between pay structure similarity and a dummy variable equal to one if the institutional investors' payoff sensitivity to the firm's value is below the median. For shareholders' returns, I find that the interaction term is negative, significant, and greater than the unconditional effect. This finding suggests that

[26] I use the following independent variables: log of assets, the log of age, return on assets, capx/assets, xrd/assets, tangible assets/assets, market-to-book ratio, industry fixed effects (at the SIC2 level), and year fixed effects.

Table 6
CEO pay structure similarity and shareholder value.

Panel A:

	(1) $Delta_t$	(2) $Vega_t$	(2) Q_t	(3) CAR Mk Adj_t	(4) CAR $CAPM_t$	(5) CAR $FF\text{-}3_t$	(6) CAR $FF\text{-}3\text{-}M_t$
CEO Comp Similarity in t−1	−34.019***	−12.719***	−0.029**	−0.083***	−0.065**	−0.061**	−0.074***
	(12.431)	(2.096)	(0.013)	(0.026)	(0.026)	(0.026)	(0.025)
Observations	18,122	18,163	24,085	24,176	24,176	24,176	24,176
R-squared	0.033	0.033	0.094	0.012	0.015	0.016	0.006
Controls	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES

Panel B: IIs' incentives to be engaged

	(1) $Delta_t$	(2) $Vega_t$	(2) Q_t	(3) CAR Mk Adj_t	(4) CAR $CAPM_t$	(5) CAR $FF\text{-}3_t$	(6) CAR $FF\text{-}3\text{-}M_t$
(CEO Comp Similarity in t−1)(Low LL incentives in t−1)	22.853	18.977***	0.013	−0.077*	−0.091**	−0.089**	−0.097**
	(25.273)	(3.615)	(0.017)	(0.040)	(0.040)	(0.038)	(0.039)
CEO Comp Similarity in t−1	−47.125**	−23.031***	−0.036***	−0.005	0.017	0.023	0.014
	(21.443)	(3.598)	(0.013)	(0.029)	(0.029)	(0.028)	(0.028)
Low LL incentives in t−1	−5.602	−0.376	0.011	0.102*	0.112*	0.133**	0.115**
	(24.102)	(3.155)	(0.024)	(0.059)	(0.060)	(0.058)	(0.059)
Observations	15,298	15,327	20,449	20,449	20,449	20,449	20,449
R-squared	0.035	0.037	0.129	0.014	0.017	0.014	0.009
Controls	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES

This table displays the results of the OLS panel regression of delta, market value, and cumulative abnormal returns (CAR) on CEO pay structure similarity (standardized). Market value is defined as Tobin's Q. CARs are computed using daily returns in a one-year window (252 trading days). Columns (3) to (6) use CARs computed using daily returns in a one-year window (252 trading days). Column (3) calculates CAR using abnormal returns defined in excess of CRSP Value-weighted market return (assuming a market beta of 1), Column (4) uses the CAPM model, Column (5) uses the Fama–French Three Factor Model, and Column (6) uses the Fama–French Plus Momentum model. Firm and year fixed effects are included. Controls include log of assets in t−1, log of firm age in t−1, and profitability in t−1. Panel B displays the results of the same estimations, along with a dummy equal to one if institutional investors' incentives to engage with management are above the median in 2010 (the measure of engagement incentives comes from Lewellen and Lewellen, 2022).

standardization of compensation plans might follow a one-size-fits-all template that is only suboptimal for those firms that are less relevant for institutional investors' payoffs (Lewellen and Lewellen, 2022).

6.1. Instrumental variable estimation

The previous analysis controls for all time-invariant omitted variables and anything affecting all firms each year. However, it does not control for endogeneity relating to omitted time-varying variables. For example, the need for a standardized compensation structure might correlate negatively with performance, and performance may have a delayed effect on market returns. If this is the case, the findings might result from low-performing companies being more likely to standardize their executive compensation structures.

To mitigate these endogeneity concerns, I exploit the existence of peer effects when directors serve on multiple boards to build an instrument for pay structure similarity. Specifically, I consider the standardization of the overlapping-director firm's compensation plan as an instrument for the standardization of the focal firm's compensation plan. I define an overlapping-director firm as a firm with which the focal firm shares a director. Following (Burt et al., 2020), I only consider overlapping-director firms that belong to a different industry (based on TNIC-2 from Hoberg and Phillips, 2016). Thus, the instrument only considers the variation of pay structure similarity that is explained by the standardization of another firm in a different industry.

The first-stage condition relies on the idea that directors' recommendations are influenced by what they observe in other firms. Bouwman (2011), Fernandes et al. (2013), and Foroughi et al. (2022) all show evidence of these effects. Validating this assumption, Panel B of Table IA11 shows that when two firms start sharing a director, their compensation plans become more similar (see Internet Appendix IA8 for more details). The exclusion restriction relies on the assumption that changes in the compensation structure of a different firm in a different industry are unlikely to be related to the focal firm's market returns.

One limitation of this instrument is that firms sharing a director are not randomly assigned, and firm-specific policies common to the two firms might explain the appointment of that director in both boards. The requirement of the overlapping-director firm being in a different industry helps to mitigate this concern, since it is reasonable to believe that they share a director because of

Table 7
CEO pay structure similarity and shareholder value: 2SLS analysis.

Panel A: First stage

VARIABLES	(1) CEO Similarity$_t$	(2) lg(at)$_t$	(3) lg(age)$_t$	(4) lg(sale)$_t$	(5) ROA$_t$	(6) Tang$_t$	(7) XRD/at$_t$	(8) Busy$_t$
CEO Comp Similarity of OD firm in t	0.032***	0.007	0.001	0.003	0.001	0.000	−0.001	−0.002
	(0.011)	(0.006)	(0.003)	(0.005)	(0.001)	(0.001)	(0.000)	(0.001)
Observations	14,071	14,071	14,071	14,071	14,065	14,071	14,071	14,071
R-squared	0.556	0.976	0.972	0.972	0.738	0.967	0.895	0.665
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES

Panel B: Second Stage

	(1) Delta$_t$	(2) Q$_t$	(3) CAR Mk Adj$_t$	(4) CAR CAPM$_t$	(5) CAR FF3$_t$	(6) CAR FF3+M$_t$
(CEO Comp Similarity in t−1)(Low LL incentives in t−1)	−0.088*	−0.179*	−0.208**	−0.222**	−0.162*	−0.204*
	(0.046)	(0.107)	(0.105)	(0.107)	(0.097)	(0.109)
CEO Comp Similarity in t−1	0.103	−0.629*	0.159	0.176	0.115	0.192
	(0.250)	(0.362)	(0.359)	(0.363)	(0.411)	(0.366)
Low LL incentives in t−1	0.003	0.058	0.063	0.051	0.040	0.035
	(0.026)	(0.051)	(0.050)	(0.050)	(0.049)	(0.051)
Observations	13,298	14,071	14,071	14,071	14,071	14,071
Controls	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

This table displays the results of the OLS panel regression of CEO pay structure similarity and the instrument proposed in Section 6.1. The instrument is defined as the average pay structure similarity of all firms with which the focal firms shares a director and which are in a different industry than the focal firm. Panel A presents the first stage. Columns (2) to (8) present the effect of the instrument on log of assets, log of age, log of sales, profitability, tangibility, R&D expenditure divided by assets, and busyness of the board. Panel B reports the results of the second stage of the 2SLS estimation. Column (1) uses delta as the dependent variable. The sample ends in year 2018. Column (2) uses market value, defined as Tobin's Q. Columns (3) to (6) use CARs computed using daily returns in a one-year window (252 trading days). Column (3) calculates CAR using abnormal returns defined in excess of CRSP Value-weighted market return (assuming a market beta of 1), Column (4) uses the CAPM model, Column (5) uses the Fama–French Three Factor Model, and Column (6) uses the Fama–French Plus Momentum model. Firm and year fixed effects are included. Controls include log of assets in t−1, log of firm age in t−1, and profitability in t−1. The estimations include the interaction of the instrumented pay structure similarity, along with a dummy equal to one if institutional investors' incentives to engage with management are above the median in 2010 (the measure of engagement incentives comes from Lewellen and Lewellen, 2022).

her general knowledge instead of her firm-specific knowledge (Dass et al., 2014, Faleye et al., 2018). A second limitation is that overlapping directors serve on more than one board and this multi-board condition may affect firm performance.[27] If this is the case, a firm with a specific performance level might be more likely to have an overlapping director and thus be part of the IV analysis. However, restricting the sample to firms with overlapping directors mitigates this selection bias concern, since any firm characteristic that predicts an overlapping director should affect all firms in this sample.[28] To further address this concern, in the analysis I also control for the fraction of multi-board directors of the focal firm's board.

Using this instrument, I run a 2SLS analysis with firm and year fixed effects. Column (1) of Panel A, in Table 7, reports the results of the first-stage estimation. Column (1) shows that the coefficient estimate of the instrument is significant at 1%. Importantly, Columns (2) to (8) show that firm characteristics — assets, age, sales, profitability, tangibility, R&D expenditure, and the fraction of multi-board directors on the board — do not predict the pay structure similarity of the overlapping-board firm, which is in line with the exogeneity of the instrument. Panel B in Table 7 presents the second-stage results and shows that all my findings are fully robust to using this instrument for similarity. Specifically, I find that the instrumented variations in pay structure similarity translate into decreases in delta, market value, and shareholders' returns. All these effects are notably stronger when institutional investors have higher incentives to follow a one-size-fits-all regime.

[27] Some studies suggest that because multiple-board directors have high qualifications, they have a positive impact on performance (Ferris et al., 2003, Masulis and Mobbs, 2011, and Field et al., 2013), while others propose that multiple-board directors are too busy to perform well (Core et al., 1999, Fich and Shivdasani, 2006, and Ahn et al., 2010).

[28] Indeed, the instrument — the pay structure standardization of an OD firm — does not correlate with the fraction of multi-board directors on the focal firm's board.

Table A.1
Variable definitions.

CEO pay structure similarity	average similarity of the firm's structure compensation relative to all other firms (see Section 3.1) (Execucomp)
Benchmark peer	dummy variable equal to one if the two firms share a benchmark peer group in year t (ISS Incentive Lab)
Overlapping director	dummy variable equal to one if the two firms share a director in year t (ISS Directors Dataset and Boardex)
Same zip code	dummy variable equals one if the two firms have their headquarters in the same zip code in year t (Compustat)
Same consultant	dummy variable equal to one if the two firms share a compensation consultant in year t (ISS Incentive Lab)
Institutional investor ownership	institutional ownership shares/(shrout1*1000000) (Thomson Reuters Institutional (13F) Holdings)
II incentives	the percent increase in annual management fees for the mean institutional shareholder if the firm goes up 100% in value. This measure comes directly from (Lewellen and Lewellen, 2022). Because the measure is provided quarterly, I use the average value for each year.
KMS shareholder distraction	shareholders' distraction measure proposed by Kempf et al. (2017). This measure was downloaded from the authors' website.
SOP-frequency voting share	number of votes/number of outstanding shares (ISS Voting Analytics)
ISS negative recommendation	dummy variable that equals one if the firm received a negative SOP recommendation from ISS in the next year (ISS Voting Analytics)
Review of engagement activities by ISS	dummy variable equal to one if (votes in favor SOP/(votes in favor + votes against)) is below 70% and zero if it is above 70%
CAR Mk Adj	cumulative abnormal daily returns during the calendar year using a one-year window (252 days), with abnormal returns defined in excess of CRSP value-weighted market return (assumes market beta of 1)
CAR CAPM	cumulative abnormal daily returns during the calendar year using a one-year window (252 days), with abnormal returns defined with the CAPM model
CAR FF-3	cumulative abnormal daily returns during the calendar year using a one-year window (252 days), with abnormal returns defined with the Fama–French Three Factor model
CAR FF-3	cumulative abnormal daily returns during the calendar year using a one-year window (252 days), with abnormal returns defined with the Fama–French Three Factor plus Momentum model
Log assets	$log(1 + at_t)$ (Compustat)
Age	listing vintage computed as the first year the firm first appears in the CRSP/Compustat merged database (Compustat)
Profitability	$oibdp_t/at_t$ (Compustat)
Market to book ratio	$(prcc\_f_t * cshpri_t + dlc_t + dltt_t)/at_t$ (Compustat)
Tangibility	$ppent_t/at_t$; $ppent$ is set to zero when missing (Compustat)
XRD/at	xrd_t/at_t; xrd is set to zero when missing (Compustat)

7. Conclusion

This study reports a one-size-fits-all trend in executive compensation structures, largely driven by institutional investors' influence and proxy advisors' recommendations. Moreover, the increased similarity in compensation structures is associated with lower firm valuation and stock returns. While standardization could streamline governance practices and enhance comparability among firms, the empirical evidence presented here highlights the potential costs associated with such uniformity.

The findings in this paper contribute to a better understanding of how increasing investor scrutiny and proxy advisors' recommendations can lead to suboptimal outcomes if they are not tailored to individual firms' specific contexts and needs. Moreover, they contribute to the debate on the role of information intermediaries, highlighting the potential dangers of excessive reliance on them.

Importantly, the paper also shows that recent regulations, including expanded compensation disclosure and shareholder voting, translate into pay structure standardization. These findings reveal the unintended consequences of two prominent types of regulation in the corporate world, enriching the ongoing debates surrounding the efficacy of regulatory and investor-driven interventions in corporate governance.

Finally, while this study focuses on executive compensation, more research is required to determine whether institutional investors and proxy advisory firms foster similar one-size-fits-all trends in other aspects of firm policies and corporate governance.

Additionally, while this paper presents the negative consequences of CEO compensation standardization, future investigations might identify its potential benefits and determine whether they compensate for the loss in market value in some cases.

Appendix A. Variable definitions

See Table A.1.

Appendix B. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.jacceco.2024.101708.

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