Compensation Consultants: Whom do they serve?
Evidence from Consultant Changes

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Abstract

We investigate whether compensation consultants recommend excessive pay to earn repeat business by studying consultant changes. Our results show consultants' interests are aligned with shareholders' to appropriately pay the CEO. Boards dismiss consultants making large pay recommendation errors, particularly positive ones. However, powerful or poorly monitored CEOs interfere with such disciplinary turnover, weakening the relation. Peer groups are more likely to change with new consultant appointments. New consultants are less likely to include highly paid executives in the compensation peer group and CEO pay falls following the change. Directors earn higher votes in annual elections when they replace compensation advisors.

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"What consultant is ever going to get another assignment if he says you should pay your CEO down in the fourth quartile? It isn't that the people are evil or anything, it's just that the nature of the situation produces a result that is not consistent with how representatives of owners should behave."

- *Warren Buffet, Berkshire Hathaway Annual Meeting, May 2017*

I. Introduction

Approximately 90% of large, U.S. public firms retain compensation consultants to advise on setting executive pay.[1] These consultants supply proprietary data on other firms' compensation, select a list of peers to benchmark pay, and guide the compensation committee through compliance with regulatory and tax related issues. Most importantly, they offer recommendations on appropriate compensation contracts for top management. The amount and mix of pay can be difficult to determine. Research shows the size and structure of CEO compensation significantly affects firm performance (Mehran (1995), Core, Holthausen and Larcker (1999), Murphy (2000), Frydman and Jenter (2010)) and excessive CEO compensation is associated with the destruction of shareholder wealth (Bebchuk, Cremers, and Peyer (2011)).

Firms hire compensation consultants to align managers' and shareholders' incentives. However, as suggested above by Mr. Buffet, critics often claim consultants instead enrich powerful CEOs by recommending excess compensation to get re-hired. In this paper, we investigate whether compensation consultants utilize their expertise to help formulate the appropriate pay package and explore when CEOs might co-opt these advisors to extract compensation rents. In doing so, we pose two simple questions: why do compensation consultants get fired and what happens to CEO pay after they are dismissed? Studying the causes and consequences of consultant dismissals should illuminate the motivation for why firms retain them in the first place.

[1] In our sample, the percentage of firms in the S&P 900 using consultants increased almost monotonically from 86.9% in 2006 to 94.5% in 2014.

The CEO is clearly incentivized to influence the pay setting process, which includes the hiring and retention of the preferred compensation consultant. As such, scholarly work recognizes compensation consultants face at least two potential conflicts of interest when providing CEO pay recommendations (Murphy and Sandino (2010), (2020)). The "repeat business" conflict suggests rent-seeking managers shop consultants, only hiring those recommending the most lucrative pay packages. Incumbent consultants fear they are less likely to be rehired by the firm (i.e., earn repeat business) if they do not recommend outsized pay to top management. This concern is exacerbated by the "cross-selling" conflict, where consultants also provide other services to the firm (e.g., audit services or benefits administration), thereby heightening the economic risk for recommending too little remuneration for the CEO. While the CEO cannot be sure what their consultant will ultimately recommend, the power to choose (or at least influence) who provides these services to the firm is likely to stack the deck in favor of the manager.

The implicit assumption underlying this concern is that managers desiring excessive compensation are, in fact, responsible for retaining or dismissing the consultant. In current practice, the board of directors has a duty to represent shareholders' interests and is responsible for approving CEO pay. Although the compensation committee relies on their consultant's advice, ultimately the directors are the ones held accountable for whether CEO pay is appropriate when they go up for re-election at the annual meeting. Further, while management occasionally retains their own consultants, our data suggests the board contracts with the compensation advisor at nearly 90% of firms.[2] Thus, we present an alternative argument that the repeat

[2] It is typically clear in the firm proxy statement as to which party is responsible for retaining the consultant. For example:

- "In determining executive compensation for fiscal 2008, the Compensation Committee engaged F.W. Cook as its independent consultant. This selection was made directly by the Compensation Committee. F.W. Cook provides no other compensation or benefit consulting services to ADC." (ADC Tele communications DEF-14A filing, fiscal year 2008)

business motivation may not be a conflict, but rather an incentive. That is, if the board holds the power to dismiss consultants, then consultants are incentivized to recommend appropriate pay.

It remains an empirical question for which agent more strongly projects their desires upon the consultant's incentive structure. We start with the view that a profit maximizing consultant will want to remain employed. Ideally, compensation consultants will recommend appropriate pay to keep favor with the board, but they may be tempted to suggest more lavish compensation if the CEO can influence their hiring or retention. For the board, consultant selection is a search process. Consultants are evaluated and retained based on their expected ability to recommend optimal pay levels. As with any assessment of expected performance, the board does not know ex-ante whether the consulting firm retained can provide proper pay recommendations, but failure should result in consultant dismissal. If managers are unhappy with their current compensation, they will likely attempt to influence this process by advocating for the dismissal of the existing consultant and appointing a new advisor who will recommend higher salaries. The strength or weakness of the board will be a moderating factor in the success of the CEO influencing consultant choice. Put succinctly, boards should demand small absolute errors in pay recommendations while CEOs may desire large positive ones. It is unclear which of these will penalize a consultant more.

To answer this question, we use a direct, easily observable ex-post measure of whether the consultant achieved repeat business or not: compensation consultant turnover. Such turnover is common; over one in five firms decide to change consultants each year. Naturally, a moderating factor is the capability of top management to influence the choice of consultants. We

- "In connection with the Company's March 2011 annual compensation review meeting, management retained Compensia, Inc. to conduct an independent review of the 2010 compensation peer group and the 2010 compensation peer group…." (Expedia DEF-14A filing, fiscal year 2011)

explore the cross-sectional variation in the board verses managerial power dynamic to provide confirmatory evidence. Prior research suggests certain factors affect the board's power relative to management. Specifically, board power increases when there is a higher percentage of board independence, a lower percentage of board members hand-picked by the CEO, the CEO and chairman of the board are separate roles, and when the CEO has shorter tenure. We predict that powerful, attentive boards are more apt to replace their consultant for inappropriate ex-post recommendations, while imperialistic CEOs will influence the pay setting process vis-à-vis consultant retention.

We use a hand-collected sample of 6,230 firm-year observations of S&P 500 and S&P 400 firms that employ a compensation consultant from 2007 to 2014 to answer these questions. We find firms switch compensation consultants following excessive levels of CEO pay. Specifically, boards are more likely to dismiss their consultant when they issue large recommendation errors. The effect is asymmetric, as dismissals occur more often when abnormal compensation is positive than negative. Further, the effect is most pervasive when board power is strong. Our tests control for an array of firm, CEO, and governance characteristics that logically explain consultant dismissals, but terminations could be driven by other factors correlated with abnormal pay. Consequently, we implement an identification strategy that exploits year-by-year variation in the regional cost of living as a shock to the benchmark level of pay (and therefore abnormal pay). We also address the possibility that our results are driven by omitted variables or functional form misspecification by utilizing firm fixed effects (Gormly and Matsa, 2014) and a propensity score matched sample (Shipman, Swanquist, and Whited, 2017). We continue to find consultant dismissals following excessive pay in each of these settings.

Our results suggest strong boards tend to be in control of the consultant retention decision. However, dismissals are logical only if there is a clear mechanism for adjusting to the proper quantum of pay. The consultant's primary role is to provide advice on the appropriate peer group and data on peer pay. These recommendations meaningfully influence the CEO's compensation (Bizjak, Lemmon, and Naveen (2008)). As such, we explore this mechanism by hand-collecting the peer group constituency for each of our sample firms and examine the average CEO pay levels for the peer group before and after consultant switches. We find firms changing consultants are more likely to reformulate their peer group if the CEO was previously overpaid. Among firms that change consultants, those with previously significantly overpaid CEOs (large positive recommendation errors) are less likely to add peers with higher compensation levels, thereby correcting one of the biases in the pay benchmarking process identified by Bizjak, Lemmon, and Nguyen (2011). Taken together, these results suggest peer group changes are a main channel through which consultant switches impact CEO compensation.

We next examine the consequences of consultant dismissals for CEO pay. We find total compensation falls following a consultant change. Again, the effect is only present for CEOs with positive abnormal compensation and the results are robust when adjusting our estimation for possible selection issues (Li and Prabhala, 2007). CEO pay decreases by $213,700 following a consultant change for CEOs classified as previously overpaid. There is no identifiable effect for CEOs that are arguably underpaid. Finally, our results indicate shareholders reward the board of directors for upholding their best interests. We examine investor reactions to these decisions from over 20,000 individual director elections. We find the board of directors receives higher vote totals following a consultant change when the CEO is overpaid. The effect is stronger for those directors serving on the compensation committee. This finding suggests the heightened

shareholder support at the ballot box is a consequence of the consultant change and confirms the argument that corporate directors are accountable to shareholders for their decisions regarding the pay setting process.

Our research contributes to the growing compensation consultant literature in several ways. First, while most studies have focused on cross-selling conflicts, this paper addresses and reframes the repeat business conflict of interest, on which there is only nascent literature (Murphy and Sandino (2010) Cho, Hwang, Hyun, and Shin (2020)). We advance the literature by examining the determinants of consultant switching behavior for large U.S. public companies and provide empirical evidence that consultants are incentivized to recommend proper pay.

Second, our evidence adds to the larger debate regarding whether compensation consultants face conflicts of interests that are detrimental to shareholders. To date, the literature offers mixed results either finding support for conflicts of interest (Goh and Gupta (2010), Cho et al. (2020), Chu, Faasse, and Rau (2018)) or finding no significant evidence for such conflicts (Cadman, Carter, and Hillegeist (2010), Murphy and Sandino (2010), Armstrong, Ittner, and Larcker (2012)).[3] Specifically, our paper builds on Goh and Gupta (2010) in several ways. First, we investigate what causes consultant switches to occur. We then test the relation between consultant switches and CEO pay similar to the primary tests in Goh and Gupta (2010). However, our critical advancement of this test is to use abnormal pay in the previous year as the key explanatory variable. We find consultant switches are related to subsequent declines in total pay for the subset of firms that were overpaid in the previous fiscal year. We provide supportive evidence of our main results by examining peer group changes and director voting outcomes. Our findings suggest such conflicts are mitigated with the right governance structure,

[3] Murphy and Sandino (2010) find evidence for the cross-selling conflict of interest and no result for the repeat business conflict of interest.

contributing to the broader literature on optimal compensation contracts. Understanding the incentives of consultants in setting executive pay allows shareholders and regulators to better monitor executive pay practices.

Finally, we note that studying the CEO pay mix is beyond the scope of our study. Edmans, Gosling, and Jenter (2023) report that boards are chiefly concerned with their CEOs' perception of fairness (i.e., their total pay relative to peers), and this factor ranks far above their consumption demands. Further, the appropriate composition of pay is difficult to empirically estimate for a given CEO and more subject to compromise according to the directors surveyed by Edmans et al. (2023). They also note only 34% of directors state the mix of pay is the most important factor for motivating their CEOs. CEOs and boards are the primary actors for examining compensation consultants' impact on pay. Because the quantum of pay is the first-order concern for CEOs and boards, our paper focuses on the level of CEO pay relative to its benchmark.

II. Role and Influence of Compensation Consultants on Setting CEO Pay

As evidenced by the volume of scholarship on the topic,[4] it is challenging to determine the appropriate quantum of pay that would adequately incentivize top management to work in shareholders' interests. Thus, it is not surprising that around 90% of firms in the S&P 900 hire a consultant for expert assistance with this process (Murphy and Sandino (2010), Armstrong et al. (2012), Chu et al. (2018)).

A. Role of Compensation Consultants

Engaging a consultant provides the board access to experts with proprietary data on current CEO pay at public and private peer firms and may offer legal cover should a pay package

[4] See Aggarwal (2007) and Murphy (2013) for excellent reviews on the subject.

ever be challenged in a court of law. However, many compensation committees simply follow the consultant's recommendations (Bebchuk and Fried (2004)). Doing so effectively hands shareholders' delegated control rights on CEO pay over to the compensation consultant.

Prior evidence suggests consultants face conflicts of interest when providing their advisory services (Murphy (1999), Bebchuk and Fried (2003), (2004), Waxman (2007)). A stylized fact in the compensation consultant literature is that firms using compensation consultants have considerably higher total and equity-based pay than firms that do not retain consultants (Conyon, Peck, and Sadler (2009)). Murphy and Sandino (2010), (2020) suggest two primary ways a compensation consultant's objectivity may be compromised: the lack of independence due to the other services the compensation consultant offers to the firm (i.e., cross-selling), and the incentive to recommend higher than optimal pay to increase the likelihood of repeat business.

A common regulatory response to perceived CEO self-dealing is mandated disclosure, under the belief that sunlight is the best disinfectant (Murphy (2013)). In the last 15 years, the Securities and Exchange Commission (SEC) issued regulations specifically targeting the advisory industry. On August 11, 2006, the SEC issued Release 33-8732, which modified the required disclosures under the Securities Exchange Acts of 1933 and 1934. This new rule, effective November 7, 2006, mandated U.S. public corporations to identify and describe the role of consultants providing executive compensation advice.[5]

Following the 2006 disclosure requirements, several studies examined the potential conflicts of interest that compensation consultants may face using the new data created by these regulations (Murphy and Sandino (2010), Armstrong et al. (2012), Cho et al. (2020), Chu et al.

[5] https://www.sec.gov/rules/final/2006/33-8732a.pdf

(2018)). Examining concerns over cross-selling, Murphy and Sandino (2010) study both U.S. and Canadian firms and find that consultants also offering non-pay advisory services provide higher pay recommendations.[6] In other work, Chu et al. (2018) focus on firms that switched to the newly created spinoff consultant practices resulting from a 2009 SEC regulation (Release 33-9089) that forces the disclosure of fees paid to compensation consultants for all services rendered.[7] CEOs at these firms were paid significantly more than those who stayed with the multi-service consultant or switched to a different consultant.

The repeat business conflict of interest, however, has garnered much less attention in the literature. Murphy and Sandino (2010) were first to study this conflict by comparing consultants hired by management versus the compensation committee. However, they find no evidence of the repeat business conflict. Cho et al. (2020) examine a small subset of firms that report fees following the 2009 rule and document a positive relation between advisor fees and CEO pay.

Goh and Gupta (2010) are the first, to our knowledge, to use consultant switching as a setting to analyze potential conflicts of interest. The authors study FTSE 350 firms in the United Kingdom from 2002 to 2008 and test whether consultant switches are associated with changes in various components in executive pay after the switch. While they find no relation between consultant switches and total pay, they document an increase in the salary component of pay and a decrease in overall compensation package riskiness.[8] Together, they interpret these results as limited evidence of opinion shopping by executives in the United Kingdom.

[6] Cadman et al. (2010) also test for the cross-selling conflict of interest but do not find a relation between CEO pay and potential conflicts of interest of the compensation consultant.

[7] On December 16, 2009, the SEC specifically targeted cross-selling conflicts for compensation consultants with Release 33-9089. Effective February 28, 2010, if a firm hires a compensation consultant and the consultant provides other services to the firm in excess of $120,000, the firm is required to disclose both the fees charged for compensation consulting and the fees charged for other services

[8] Notably, they do not explore the relation between future CEO pay and consultant turnover when prior pay is abnormally high or abnormally low. Consultant switches when the CEO was arguably overpaid or underpaid are treated the same. More importantly, the factors preceding consultant turnover are not explored at all in their analysis.

Both Goh and Gupta (2010) and Cho et al. (2020) provide limited evidence for the use of consultants to support excessive pay and interpret the findings as evidence of a repeat business conflict. Overall, the extant evidence on repeat business is incomplete and little work exists on why U.S. firms choose to switch compensation consultants, suggesting the need for more research.

B. Compensation Consultants' Involvement and Incentives in the Pay Setting Process

In our study, there are three relevant parties in the pay setting process: the CEO who will advocate for the highest possible pay, the board who is tasked with awarding pay that incentivizes, rewards, and retains a valued executive in a way that pleases shareholders, and a compensation consultant that advises these parties on appropriate pay.

The board, the CEO, and the consultant have imperfect information about what level of compensation will appear appropriate ex-post, although consultants' estimates are arguably better. Indeed, the very act of retaining a consultant to advise the board on compensation levels is prima facie evidence for the information advantage consultants have over boards regarding appropriate CEO pay. Due to the lagging nature of SEC filings, at the time pay is set, the board is privy only to the prior years' peer compensation data. In contrast, consultants have access to private information about current pay levels across all firms because of their ongoing engagements with other clients. The consultants also have a comparative advantage when determining appropriate pay due to specialization and their accumulated professional experience. Notably, the consultant's ability to develop a high-quality pay recommendation based on the data is unknown to the board at the time they are initially retained.

It is clear, however, that a profit maximizing consultant will rationally seek recurring revenue and is at liberty to use their information advantage to ensure retention by either advising

the board on appropriate pay levels or alternatively using it to justify higher pay for the CEO. Whatever their motivations, the retention or dismissal of a compensation consultant is an unambiguous indication of whether they were successful in obtaining repeat business from their client. If consultants do, in fact, leverage this information advantage, then examining pay prior to consultant retentions or dismissals should be informative for whether managers or the board (and by extension, shareholders) were the primary beneficiaries.

CEOs have imperfect information about what the consultant will recommend, but they may seek to heavily influence the consultant's recommendations if they have the power to fire the advisor. As noted by Murphy and Sandino (2010), the consultant's desire for repeat business presents a serious conflict of interest and the consultant may be incentivized to advocate outsized pay for the CEO. If this is systematic, we expect to find firms changing consultants following low levels of CEO pay and retaining them when pay is high. Under this view, the board's interaction with the consultant is largely performative and the CEO exerts influence over both parties to corrupt the pay setting process. Therefore, the relative power dynamic between the CEO and the board is a key moderating factor. If inattentive boards blindly follow consultants' recommendations, as suggested by Bebchuk and Fried (2004), the problem should be particularly perverse at companies where the CEO is powerful and board oversight is weak. In these situations, management can influence the board's decisions to obtain a more generous consultant.

The CEO's desires should present less of a concern when investors have strong representation on the board. Resolute directors will assess the pay recommended by their consultant ex-post and retain or fire them based on whether it was appropriate. Thus, the consultant will be incentivized to recommend optimal CEO pay at these firms. In this case, the repeat business motive is not a conflict of interest, but rather a mechanism through which the

consultant is incentivized to serve stockholders' interests. Again, the quality of the corporate governance at the firm is an important moderating factor. We expect strong boards will change consultants whenever they are unable to formulate the appropriate compensation contract.

The preceding discussion has directional implications for the relation between CEO pay and consultant turnover. CEOs exerting influence will attempt to use their power to dismiss consultants following periods when they feel they are underpaid. However, the board may also dismiss consultants following periods of abnormally low CEO pay, albeit for different reasons. For example, remuneration is a primary talent retention mechanism for high quality CEOs (Bizjak et al. (2008)). Thus, abnormally frugal compensation contracts could be costly to shareholders if they cause a talented CEO to take a position elsewhere. Indeed, Edmans et al. (2023) report that 65% of corporate directors consider CEO retention when setting the level of pay. The net effect depends upon the relative costs of possibly losing a talented CEO balanced against the savings from limiting pay-related agency problems. Therefore, if a consultant change occurs following low levels of CEO pay, it is difficult to establish whether consultants are using their role to serve the board or whether CEOs can corrupt the process to enrich themselves.

Therefore, we focus much of our empirical attention on periods of overpayment where the board's and CEO's interests diverge because it allows us to better observe consultants' motives. When pay is high, the CEO will recognize the odds are low that another consultant will recommend even higher pay. In contrast, the board will want to take aggressive action when pay is overly generous and the firm risks social outrage costs from the recommendation error. When boards are attentive, we expect to find dismissals following high CEO pay. Finding such evidence would suggest consultants are evaluated and retained based on their ability to

recommend optimal pay levels. However, we may find the exact opposite when the locus of power favors the CEO.

It is important to note that the board may not always select the correct compensation consultant on their first attempt. Consequently, the existence of a previous consultant who recommended suboptimal pay is not inconsistent with the argument that consultants fear discipline from the board. Rather, it is only a requirement that the board respond to material recommendation errors upon reviewing pay levels ex-post when peer level pay is revealed during the next "proxy season" (i.e., April to June each year) and the information asymmetry is resolved. Thus, the board's hiring and retention of the proper compensation consultant is a search process.[9]

We can corroborate our findings on the compensation consultant's role in the pay setting process by looking at what happens after the advisor is dismissed. Under a board-centric model, if there is a change, the new consultant should be more successful at recommending optimal CEO pay. Following excessive pay, consultant changes should result in declining CEO pay.[10] If there is a consultant change due to CEO influence, we expect the new consultant would be more apt to reward managers with excessive pay. Therefore, in this case, CEO pay should rise following the hiring of a new pay advisor.[11]

Further, we can examine the reaction of shareholders to gain additional insight as to what motivates compensation consultants. If consultant turnover reflects the execution of board discipline, then shareholders should be pleased when they see this authority properly exercised. As such, they should reward the compensation committee with their voting support in director

[9] This process is analogous to the hiring and firing of CEOs by a board where the manager's ability and motivation are unknown ex-ante and this information may be revealed slowly to the board (Taylor, 2010; Dangl, Wu, and Zechner, 2008). The quality of the board is measured in the literature by how they respond to a poorly performing CEO, not whether the bad CEO was initially retained in the first place.
[10] Especially if the prior consultant's dismissal clearly signals the board is in control over the retention decision.
[11] Again, the decision might eliminate uncertainty about who has the power to dismiss the firm's consultant, which in this case is the CEO.

elections for seeking a better pay advisor to design the CEO's contract. However, in those instances where consultants are favoring the CEO's interests, we would expect shareholders to express disapproval with the compensation committee for allowing such opportunism. If pervasive, then, on average, consultant changes should be associated with lower vote totals for the compensation committee members when they seek re-election at the annual meeting.

III. Sample Selection and Descriptive Statistics

A. Sample Selection

Our initial sample includes all firms listed in the EXECUCOMP database as members of either the S&P 500 Large Cap or S&P 400 Midcap (referred to as the S&P 900) indices for any duration between 2007 and 2014.[12] We collect data on compensation consultants and compensation peer groups by hand from SEC Form DEF-14A definitive proxy statements found on the SEC's Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system starting with the first year (i.e., 2006) that firms were required to disclose detailed information regarding their compensation consultant. We identify consultant changes wherever the current consultant is different from the one listed in the previous proxy. Therefore, we drop firm-years in which the firm does not file a proxy. After these screens, we have 8,700 firm-year observations.

We remove observations from the sample that never hire a consultant during our period of study. This filter eliminates about 3% of the firm-year observations, reducing our sample to 8,390 firm-year observations. If a company hires a consultant for at least one year during the sample, they are retained for all years. Therefore, our sample contains firms that change

[12] Firms were not required to disclose their compensation consultants until SEC Release 33-8732A became effective in 2006. Because we need one year of lagged data to identify changes, our sample starts in 2007. SEC Release 33-9089, which became effective in early 2010, changed the nature of the compensation consultant industry, causing many multi-line consultants to spin-off their compensation advisory practices. The market share data reported in Table 2 suggests the industry had stabilized by 2011. Thus, our sample period offers a symmetric four-year analysis period for both before and after the effective implementation of this important rule change. It also economizes on our hand collection efforts.

consultants and firms that retain consultants. For regressions involving peer group firms' pay levels, the peer groups are restricted to companies listed in EXECUCOMP.

We retrieve data on firm characteristics and CEO compensation, stock returns, and governance from the Compustat and Execucomp databases, the Center for Research on Securities' (CRSP) daily and monthly stock files, and Institutional Shareholder Services' (ISS) directors and governance databases, respectively. All variables in our analysis are defined in Appendix A. Our final sample consists of 6,230 firm-year observations representing 989 unique firms.

[Table 1]

B. Descriptive Statistics

Table 1 shows the frequency of consultant changes. Firms change compensation consultants quite often, as this occurs at 21% of firms per year.[13] The temporal distribution of the change in consultants exhibits some considerable variation. Of note is the spike in consultant switching in 2009 and 2010. This spike is largely driven by the consultant industry spin-offs documented in Chu et al. (2018) and settles down by 2011.

Table 1 also presents how many consultants each firm retains and the engaging party. The board or compensation committee (management) is stated as the engaging party 90% (7%) of the time. Approximately 9% of all firm-years retain two or more consultants and divided firms (where both the board and the management hire separate consultants) make up about 6% of the sample. The Internet Appendix provides further details on consultant switches. Firms tend to

[13] It is possible that a specific consultant changes advisory firms and, consequently, the board decides to change compensation consultant practices to remain with the specific consultant. One might expect this to occur if a specific consultant either consistently recommended appropriate pay or abnormally high pay. This reasoning would add noise to tests of whether compensation consultants fear disciplinary turnover by the board and bias against the CEO influencing consultant selection when studying the motivation for a change in consultants. However, one would not expect an ex-post downward adjustment in CEO pay with a new consulting practice if this was the main reason for consultant switches. Pay should remain at its current level or move higher. Unfortunately, unlike with specific audit partners at public accounting firms, individually named consultants are not disclosed in the SEC filings and individual moves are impossible to account for by the researcher. We caution the reader against this possibility when interpreting our results.

move laterally when they switch consultants (high market share to high market share or single service to single service). Most firms use high market share consultants. Moreover, prior to the compensation consultant disclosure requirement, firms used multi-service firms more.

[Table 2]

Table 2 presents details regarding the top-15 consultants. The first three columns depict the average market share of the top consultants over different time periods. As noted in the literature, several consultants hold considerable market share, even with the 2009 SEC regulations' impact. For example, Frederic W. Cook had an average market share of 15.98% prior to the regulation and an average market share of 21.68% post regulation. Column 4 of Table 2 describes whether each consultant concentrates in an industry or is more of a generalist. According to our measure, the following practices are classified as industry specialists: Frederic W. Cook, Mercer, Pearl Meyer, Compensia, Hay Group, Steven Hall & Partners, and FPL Advisors. The last several columns of Table 2 detail whether the consultant is a multi-service consultant, the number of offices each consultant practice has, as well as whether the consultant has an international practice. More details about the top-15 consultants are specified in the Internet Appendix.

[Table 3]

Table 3 presents firm, compensation, and board characteristics for the sample companies. Of particular interest are the total, industry-adjusted, and abnormal pay variables. The average sample CEO earns $7.6 million. The industry-adjusted total pay has a positive mean and median, suggesting that the typical sample CEO is paid higher than the industry average. This univariate statistic is expected because our sample uses larger S&P 900 firms and the industry average adjustment is for all firms in EXECUCOMP. Since abnormal pay controls for firm size, which is right-skewed, its distribution is more symmetric than unadjusted or industry-adjusted pay.

Bifurcating abnormal pay into its positive and negative components reveals a higher variance on the positive side. The benchmark pay model is more precise when pay is low, which may bias against finding results on the positive bifurcation. We winsorize variables at the 1% and 99% levels to mitigate outliers. Other firm and board characteristics are comparable to the literature (Faulkender and Yang (2010), Cai, Kini, and Williams (2016).

IV. Results

A. Why Do Firms Switch Compensation Consultants?

The most direct ex-post measure of whether a compensation consultant achieved repeat business is their retention in the following year. We exploit this setting to explore the board's reasons for changing consultants. To examine the determinants of changing consultants, we run the following Probit regression model:

$$(1)\ Change\ in\ Consultant_t = \alpha + \beta_1 Recommendation\ Error_{t-1} + \beta_2 Firm\ Chacteristics_{t-1} + \beta_3 Governance\ Chacteristics_{t-1} + \beta_4 Consultant\ Chacteristics_{t-1} + Year\ FE + Industry\ FE + \varepsilon$$

The dependent variable is *Change in Consultant$_t$,* an indicator variable that equals one if the consultant retained in year *t* is different from the consultant retained in the prior year. The key independent variable in this analysis is the CEO pay recommendation error from the compensation consultant prior to a potential switch (*Recommendation Error$_{i,t-1}$*). Following Murphy (2013), we focus on grant-date pay (i.e., Execucomp item TDC1) to assess the level of pay at the time it was recommended by the consultant and awarded by the compensation committee. Specifically, we are concerned whether the CEO received pay above or below expected norms. Unfortunately, the suitable level of CEO pay is not directly observable. To address this challenge, we estimate the "abnormal" level of pay (*Abnormal Pay$_{i,t-1}$*) following Yermack (2006), which formulates an annual benchmark pay on the basis of industry, firm size,

stock price performance, and executive experience. This computation is thoroughly described in Appendix A.[14] By using this measure, we rely on existing techniques to obtain a parsimoniously derived benchmark level of pay that explains variations in executive compensation in a readily apparent fashion to boards, consultants, peer CEOs, and the investing public. Our goal is to arrive at a statistically valid pay benchmark that facilitates a reasonable outside assessment of CEO pay without unnecessary complexity for the firm's stakeholders and the financial press. As described in the ensuing paragraphs, we derive several different measures of the consultant's recommendation error using $Abnormal\ Pay_{i,t-1}$.

As argued by Bebchuk and Fried (2004), we assume the board acts upon the advice of their compensation consultant, at least in part, when setting pay. Consequently, we attribute observed ex-post abnormal compensation to the consultant's recommendations. If this assumption is valid, then the estimate on β_1 helps distinguish whether compensation consultants concern themselves with disciplinary turnover by the board when seeking to earn repeat business. A significant coefficient suggests that boards do respond to pay recommendation errors by their compensation consultant when determining whom to retain in the following year.

Our models control for other common determinants of CEO pay, as noted by equation (1). *Firm Characteristics* include the natural logarithm of total assets, market-to-book ratio, return on assets (ROA), institutional ownership, number of analysts, annual stock returns, and debt-to-assets ratio. *Governance Characteristics* include CEO age, CEO tenure, CEO turnover, a dual class firm indicator, board size, the percentage of board independence, the percentage of outside board members considered busy, a CEO/Chairman duality indicator, a classified board

[14] The results, reported in the Internet Appendix, are robust to using abnormal log pay. In this alternative specification, we estimate the first stage model using ln(TDC1) as the dependent variable to address the possibility that skewness in CEO pay might distort our benchmark pay estimation. It is also robust to using the simple FF48 industry average pay as the benchmark.

indicator, the percentage of the outside board members co-opted by the CEO, the average size of the board's network, and an indicator for whether the firm engaged in M&A activity. *Consultant Characteristics* include indicators for whether the consultant is an industry specialist, whether they are multi-service consultants, and whether the firm retains more than one consultant.[15] All variables are constructed as of the beginning of the fiscal year. We use year and industry fixed effects to absorb any time or industry invariant unobserved heterogeneity. Standard errors are clustered at the firm level (Rogers (1993)) to account for serial dependence (Petersen (2009)).[16]

[Table 4]

Table 4, Panel A presents results of the Probit regressions examining the determinants of consultant turnover using various measurements of the recommendation error. The extant literature (Murphy and Sandino (2010), Cho et al. (2020)) suggests the repeat business conflict of interest is an important motivation for consultants, but it is not clear at this point, empirically, whether the relation is negative, positive, or even exists at all. For simplicity and comparability to the literature, we start by using the linear $Abnormal\ Pay_{i,t-1}$ as the variable of interest in Column 1.

A positive coefficient on $Abnormal\ Pay_{i,t-1}$ would imply the firm is more likely to replace their consultant when they award abnormally high pay to the CEO. Such evidence would support the idea that compensation consultants are punished for recommending pay that is objectively high to the firm's investors, at least on average. Conversely, a negative coefficient would imply firms are more likely to change consultants following low levels of abnormal CEO pay. It would be consistent with the manager using their influence to punish the consultants' poor pay

[15] While the main multi-service variable is defined following Chu et al. (2018), we perform robustness by collecting services provided by the consultant firms over time. We identify whether the consultants offer human resource services, risk management services, investment management services, tax/audit services, and investment banking. We include indicator variables for these different services in lieu of the general multi-service variable in unreported regressions. All findings are quantitatively and qualitatively the same.

[16] Results are robust to bootstrapping the standard errors.

recommendations. However, it may also be the board acknowledging that underpayment is suboptimal for shareholders if talented CEOs leave the firm for better options.

We find the coefficient on abnormal pay is statistically significant, indicating consultants are, indeed, punished for making recommendation errors. Interestingly, the coefficient is positive, suggesting higher abnormal CEO pay increases the likelihood that the firm changes compensation consultants. For example, the marginal effect for Column 1 at the sample means is 0.0024, meaning a one standard deviation increase in abnormal pay leads to an economically relevant 5% increase in the relative likelihood of changing consultants.[17]

We delve deeper into what type of recommendation errors lead to consultant turnover in Columns 2 and 3 of Panel A. Deviations from optimal pay in either direction are suboptimal for shareholders and a consultant change following significant deviations from optimal pay supports a board acting in shareholders' best interests. Therefore, in Column 2, we first replace *Abnormal* $Pay_{i,t-1}$ with the *Absolute Value of Abnormal* $Pay_{i,t-1}$ and find a positive loading on this coefficient. This finding suggests larger consultant errors, regardless of direction, are more likely to face criticism; however, nothing is said about the magnitude of those errors. This begs the question, are consultants punished for both small errors as well as very large ones? To answer, we create a set of three indicator variables for the upper three quartiles of the *Absolute Value of Abnormal* $Pay_{i,t-1}$ (labeled *Absolute Value of Abnormal Pay* $Q2_{i,t-1}$, *Absolute Value of Abnormal Pay* $Q3_{i,t-1}$, and *Absolute Value of Abnormal Pay* $Q4_{i,t-1}$). The first quartile is the omitted category. Because these indicators stratify the absolute value of abnormal pay scalar, they will denote progressively larger recommendation errors regardless of sign.

[17] The impact of the marginal effect (0.0024) of abnormal pay is calculated as the marginal effect (0.0024) multiplied by the standard deviation of abnormal pay (4.331) = 1.04 percentage points. Given the unconditional probability of consultant change is 20.8%, this 1.04 ppt change is a 5% increase in the probability of a consultant turnover.

The estimation reported in Column 3 of Panel A shows the probability of consultant turnover increases monotonically with the magnitude of abnormal pay (i.e., dismissals are more frequent when the absolute value of abnormal pay is higher). Consultants recommending compensation packages in the fourth quartile of absolute abnormal pay are significantly more likely to face dismissal than those in the first or second quartiles.[18] We conclude that boards are forgiving of small pay discrepancies. Larger errors, which arguably face social outrage and reflect on the quality of the consultant's advice, are more likely to be chastised.

It is important to recognize the linear and absolute value estimations of $Abnormal\ Pay_{i,t-1}$ in Columns 1 through 3 of Panel A potentially hide some of the mechanisms at play during consultant dismissals because the players here have conflicting desires. Shareholders should want a "V" shaped relation between pay errors and turnover while managers arguably want a "\" shaped one. Consultants replaced following abnormally low pay does not reveal much about consultant incentives, but lavish pay recommendations should be informative. Therefore, we focus on the subset of cases where CEOs are paid more than their peers. When managers are overpaid, they will desire to retain their consultant. Strong boards will want to replace them. We split abnormal pay into two variables, $Positive\ Abnormal\ Pay_{t-1}$ and $Negative\ Abnormal\ Pay_{t-1}$ in Column 4 of Table 4, Panel A. $Positive\ Abnormal\ Pay_{t-1}$ is equal to $Abnormal\ Pay_{t-1}$ when it is greater than zero and zero otherwise. If management influences the turnover of compensation consultants, then we expect the sign to be negative; however, if the board changes consultants when CEO pay is too excessive, then the coefficient should be positive. $Negative\ Abnormal\ Pay_{t-1}$ is equal to $Abnormal\ Pay_{t-1}$ when it is negative and zero otherwise. Shareholders' and managers' interests more aligned on the negative side, because the boards' concern over

[18] The coefficients are not significantly different at conventional levels for the estimates on Q3 v. Q4.

executive retention arguably outweighs any cost savings engendered by below-market pay. However, overly miserly compensation committees could attenuate this coefficient if they view underpaying their management team as value-additive.

The results in Column 4 of Panel A suggest a strong effect for the positive side of abnormal pay. The coefficient on *Positive Abnormal Pay$_{t-1}$* is economically larger and more statistically significant than the abnormal pay variable in Column 1. The marginal effect is 0.0045, suggesting that a one standard deviation increase in pay yields a 7.4% increase in the likelihood of consultant dismissal.[19] Thus, firms are more likely to switch consultants following excessive CEO pay. Notably, the coefficient on negative abnormal pay is not statistically significant. Arguably, both managers and shareholders would desire a change following low abnormal pay. However, as evidenced by the large standard errors, there exists considerable heterogeneity across firms in how they treat CEOs with abnormally low compensation.

Finally, in Column 5 of Panel A, we combine the strategies employed regarding the direction and magnitudes of the errors into a single estimation by looking at very large positive and negative recommendation errors. That is, are the consultants being dismissed the ones that recommend extremely generous or frugal pay packages? We create two new indicator variables, *Large Positive Abnormal Pay$_{t-1}$* and *Large Negative Abnormal Pay$_{t-1}$*, which denote recommendations that are above the median of the positive pay bifurcation or below the median of the negative pay bifurcation, respectively. Small positive or negative recommendation errors represent the omitted category. Again, consultants are dismissed only following very large pay recommendations. The marginal effect implies that such errors increase the likelihood of

[19] The marginal effect (= 0.0045 x 3.43) of 1.54 ppt is a 7.4% increase in turnover relative to the unconditional probability.

dismissal by 7.8%. Overall, it appears that firms are more likely to change consultants following excessive pay recommendations when consultants are arguably not serving shareholder interests.

The control variable estimates yield three interesting results. In all specifications, the prior year stock return loads negatively and significantly, suggesting companies are more likely to change consultants following poor firm performance. Firms are also more likely to change their consultant when the CEO is younger, and the CEO is not the chairman of the board. The last two results suggest a higher likelihood of consultant turnover when the manager is less powerful. We find no evidence that consultant switches are driven by the elimination of duplicate consultants following contemporaneous merger activity.

1. Endogenous CEO Pay

The association between excessive pay and consultant dismissals may be difficult to interpret if abnormal pay and consultant turnover are confounded by other factors not controlled for in our tests. For example, an overconfident (but talented) executive with above average pay might ask the board to change consultants to find one recommending even greater remuneration. Alternatively, mistakes in the proper pay quantum and the board's perception of consultant quality could be correlated, leading to simultaneity in the two variables. We offer two alternative specifications to obtain assurance about causality: an instrumental variable approach and a propensity score matched sample analysis in Panels B and C of Table 4, respectively.

Prior research shows the local cost of living is a significant factor in CEO compensation (Ales and Sleet (2016), Francis, Hasan, John, Waisman (2016), Yonker (2017)). Consequently, our first approach exploits the time series variation in regional costs of living as a shock to abnormal pay in an instrumental variables (IV) two-stage least squares (2SLS) setting. The U.S. Bureau of Labor Statistics produces a Consumer Price Index (*Regional CPI*) for four different

regions (Northeast, Midwest, West, and South) and for the entire U.S. (*National CPI*). We orthogonalize the National CPI to the Regional CPI of the company's headquarters by taking the residual from a time-series regression of the National CPI on the firm headquarters' Regional CPI. The resulting measure (*Extra-Regional CPI$_{t-1}$*) reflects how much greater the cost of living is in other parts of the country relative to the CEO's home region. We then use this as an instrument for the abnormal pay measure (*Instrumented Abnormal Pay$_{t-1}$*).

We assume that CEOs in other regions will receive relatively higher pay when *Extra-Regional CPI$_{t-1}$* increases due to the differential cost of living. As such, our identification strategy seeks to shock the empirical estimate for the appropriate level of pay (i.e., the second term in the *Abnormal Pay$_{i,t-1}$* decomposition) while holding the focal CEO's pay constant. Essentially, as CEOs in other regions experience relative cost of living adjustments, their collective pay increases will elevate the benchmark compensation level when estimating *Abnormal Pay$_{i,t-1}$*. Intuitively, we are introducing exogenous variation into peer compensation via the CPI and, consequently, abnormal compensation.[20] For a given level of focal CEO compensation, as peers exogenously adjust their own CEOs' pay for the local cost of living, the instrumented abnormal pay changes and the focal CEO is going to appear relatively more over- or underpaid.

The Extra-Regional CPI likely satisfies both the exclusion and relevancy conditions required of valid IVs. The relevance condition is testable by examining the statistical significance of the coefficient on the IV in the first stage regression. As seen in the stage one regression of Panel B, Extra-Regional CPI is significantly negatively related to abnormal pay, indicating that increases in the cost of living for other regions significantly increases benchmark

[20] Mechanically, we are instrumenting *Abnormal Pay* with the *Extra-Regional CPI* in an exactly identified system.

pay. That is, rival CEOs earn relatively higher pay when their local cost of living increases by more than the focal CEO. Holding the focal executive's pay constant, once the universe of CEO pay is disclosed in the next proxy season, the focal CEO will appear to be "underpaid" because of the extra-regional price level increases ("overpaid" for price decreases) in nationwide comparisons or in popularized surveys of CEO compensation (e.g., the *Wall Street Journal*'s annual "The Highest Paid CEOs in the S&P 500" report). Thus, this instrument specifically exploits the effect that local price level changes have on national CEO pay rankings and the board's or shareholders' ex-post perception of compensation rents earned by the focal executive when peer pay levels are revealed.[21]

Second, the instrument must not have a relation with the firm's decision to change consultants (our main dependent variable in the second stage 2SLS regression), except through its influence on abnormal pay. Firms and consultants are unlikely to materially influence the price of a broad basket of goods in U.S. regions, so there is little *a priori* reason the variable will affect consultant dismissals except through its influence on abnormal pay itself.[22] The second stage results reported in Panel B of Table 4 demonstrate that the instrumented version of abnormal pay continues to be positive and statistically significant (second stage, Column 1). The instrumented continuous versions of positive abnormal pay (Column 2) and large abnormal pay

[21] For the relevance condition, the validity of our approach is supported by research from Edmans et al. (2023) showing boards and CEOs are primarily concerned with total pay relative to peers. We are implicitly assuming, as a primary matter, they do not adjust for differential costs of living impacting peer CEOs' pay in national comparisons when assessing pay inequities. Plausible explanations for the lack of adjustment could be the limited attention for the board (e.g., the board just relies on the consultants' pooled summary data in their pay surveys) or CEO opportunism (e.g., the CEO only cares about their pay relative to peers, regardless of the rational explanation for differences). The instrument appears relevant.

[22] Our argument for satisfying the exclusion condition is simply that the CEO, board, or compensation consultant do not have the ability or desire to meaningfully affect the differential CPIs across the nation. We could envision a Machiavellian scenario where the CEO alters their local pricing to impact the local CPI to illicit a cost-of-living adjustment but dismiss it as somewhat implausible. However, it is possible that some consultants might opportunistically recommend peers geographically concentrated in high cost of living areas to justify higher focal CEO pay, thereby causing the instrument to shock both raw $Total\ Pay_{i,t}$ and the $Benchmark\ Total\ Pay_{i,t}$ proxy. If this were systematic, it would invalidate the exclusion criteria and imperil the validity of our experiment. However, if dynamic geographic benchmarking were pervasive, we believe this would also attenuate the relevance of the instrument as the first and second abnormal pay terms serve to cancel each other out (i.e., the CEO's pay moves in tandem with benchmark pay). The strong significance in the first stage hopefully assuages that concern. Notably, this sort of opportunism would likely be visible to the compensation committee and subject to censure by the board. This condition is not testable and the reader should assess the strength of our 2SLS analysis by the plausibility of our assumption that the players at hand do not influence the CPI.

(Column 3) are likewise positive and significant. The first-stage F test for our regression is large and significant (25.33, p-value 0.00) indicating a strong instrument. The economic magnitudes of the instrumented abnormal pay coefficients are somewhat larger than the baseline regression estimates in Panel A. Specifically, a one standard deviation increase in abnormal pay corresponds to an 8.5, 13.4, and 13.7 percentage point increase in the probability of consultant dismissal for second stage models 1 (instrumented abnormal pay), 2 (instrumented positive abnormal pay), and 3 (instrumented large positive abnormal pay), respectively. Given an unconditional probability of consultant turnover at 20.8%, they seem plausible. However, we caution the reader there could be other channels beyond our recognition that might violate the exclusion condition and, therefore, lean more on the confluence of endogeneity tests to assuage identification concerns.

As an alternative approach to the IV/2SLS, we conduct a propensity score matched firm (PSM) analysis to account for the systematic observable differences between firms with over- or underpaid CEOs that might reasonably explain the differences in consultant dismissal rates. Failing to properly model these confounding covariates in our Panel A tests could result in functional form misspecification that will bias our estimates in unpredictably ways. Assuming unconfoundedness, the PSM approach seeks to alleviate this concern (Tucker, 2010; Shipman et al., 2017).

We first classify firms into several different treatment subgroups based on the consultant's recommendation error from Panel A (i.e., firms residing separately in the first through fourth quartiles of the *Absolute Value of Abnormal Pay*, *Positive Abnormal Pay* and *Negative Abnormal Pay* firms, and those exhibiting *Large Positive Abnormal Pay* or *Large Negative Abnormal Pay*). Firms in each subgroup are matched to a benchmark control firm

group based on observable covariate similarity using the same control variables as outlined in Table 4, Panel A.[23] We utilize a logit regression to predict propensity scores for each firm based on whether the firm is likely to have the chosen type of recommendation error. Treated firms are matched to control firms using the nearest neighbor approach with a caliper width of 0.001 to ensure the treatment and control firms exhibit covariate balance. Further, we only use observations with common support, that is those treatment observations which have a propensity score higher or lower than the max/min score of the controls are dropped (Cameron and Trivedi, 2005). Once the match firms have been determined for each subgroup, we compute the consultant dismissal rates for each of the "treated groups" of interest and their associated PSM-based benchmark "control groups." The consultant dismissal rates for the "treated" and "control" groups are reported in Panel C.

As in Table 4, Panel A, the consultant dismissal rates in Panel C increase monotonically for small magnitude (Q1) to large magnitude (Q4) pay recommendation errors from 19.9% to 22.4%, respectively. However, the differences between the observed turnover rate and the PSM-based benchmark rates are not statistically significant at conventional levels for any of the four subgroups and are not statistically different from each other. We observe more separation when we bifurcate by the direction of the recommendation errors. Firms awarding their CEOs *Positive Abnormal Pay* or *Large Positive Abnormal Pay* dismiss their consultant 22% to 23% of the time. This propensity is significantly larger than expected from the PSM-generated benchmark dismissal rate by about four to five percentage points. In contrast, the *Negative Abnormal Pay* and *Large Negative Abnormal Pay* dismissal rates do not differ significantly from their

[23] For example, the "treated group" for the arguably overpaid CEOs (*Positive Abnormal Pay Firms*) would be those where *Abnormal Pay* > 0. The match firms would then be curated from those firms where abnormal pay is less than zero to form the "control group." Similarly, the highly overpaid CEOs, where *Large Positive Abnormal Pay* = 1, would form the "treated group" and the match firms would be generated from those firms where *Large Positive Abnormal Pay* = 0 to form the "control group."

benchmark levels. Again, the direction of the error matters for consultant dismissals, especially when they are large.

Finally, in unreported tests, we calculate the Impact Threshold for a Confounding Variable (ITCV) to estimate how large of an effect that an omitted variable must have to invalidate our primary results. We estimate an ITCV of 0.121, which is well above the highest observed correlation (0.07). Thus, it is unlikely that any remaining omitted variables have a large enough confounding effect to explain our primary results.

2. Other Robustness Tests

There may be a concern that the regime prior to SEC Release 33-9089 is materially different than the subsequent period. This regulation created several consultant spin-offs, causing a spike in the percentage of firms that switched compensation consultants in the 2009-2010 period (11-18% higher changes than the average). Further, starting in 2011, the Dodd-Frank Act began requiring firms to offer shareholders advisory "say-on-pay" votes, which arguably increased investor attention on the appropriateness of the CEO's pay.[24] To address this, we split the sample into the 2007-2008 period and the 2011-2014 period, while excluding the years immediately surrounding the SEC's disclosure requirement implementation. We report subperiod estimations in Table 4, Panel D. As shown in Columns (1) and (3), the findings on abnormal pay remain positive and statistically significant for each of the subsample periods. When we bifurcate into positive and negative abnormal pay, the results are consistent with our baseline regressions, albeit with significantly larger coefficient estimates for positive abnormal pay during the regime when shareholders cast "say-on-pay" advisory votes (difference p-value = 0.0644).

[24] Dodd-Frank Section 951(a)(2), as well as the Exchange Act Section 14A(a)(2) and 15 U.S.C. §78n-1(a)(2), requires the firm to offer an advisory vote to shareholders at the annual meeting on all executive compensation at least every three years.

Finally, it is plausible that unobservable factors (e.g., culture, labor's fairness perceptions regarding pay, etc.) could influence the company's decision to terminate a consultant when pay is too high. As a further test, we re-estimate models (1) and (4) of Table 4, Panel A using firm and year fixed effects to control for these firm-specific omitted variables. The results are similar. The coefficient for abnormal compensation remains positive 0.0139 (p-value 0.04). When split, the coefficient on positive abnormal pay is 0.0184 (p-value 0.04) and remains statistically insignificant for negative abnormal pay (unreported). Collectively, evidence from Table 4 appears consistent with consultants representing the interests of shareholders.[25]

We caution the reader that confounding factors may remain that invalidate the conclusions drawn from the evidence presented in our study despite our best attempts to address endogeneity problems. Edmans, Gabaix, and Jenter (2017) point out that instrumental variables or natural experiments offering "as-good-as-random variation" are extremely challenging to find when studying CEO pay. Therefore, we rely upon cross-sectional governance tests and post-dismissal evidence to confirm our conclusions regarding the relation between pay and consultant turnover.

B. The Moderating Effect of Corporate Governance on Consultant Dismissals

In this section we further explore the relation between consultant turnover and abnormal compensation by utilizing the cross-sectional variation in CEO power and board monitoring in our data. Board attentiveness and the board-CEO relative power dynamic are key moderating factors for whether the consultant utilizes their expertise to formulate the appropriate level of pay

[25] Our micro-level study focuses on the potentially positive and negative influences that compensation consultants have upon the pay setting process at public companies and, therefore, a full analysis of the underlying competitive equilibrium in the consulting industry itself is beyond the scope of our paper. Nonetheless, we explore the product market consequences for recommending abnormally high pay using the limited data we have on compensation consulting firms. In an untabulated analysis, we study the 173 consultant-year observations in our dataset from 2008 to 2014 where the advisory firm engages at least three EXECUCOMP listed firms in a given year. We regress the change in the consultant's market share on dismissals following abnormally high pay recommendations, other dismissals, the number of clients engaged by the advisory firm, market size, and consulting practice and year fixed effects. Our estimation suggests consultants dismissed following abnormally high CEO pay suffer declines in their subsequent market share. Dismissals for other reasons have no discernable effect.

or if they bias the pay in favor of enriching the CEO. These tests seek to uncover those situations where the CEO is most likely to exert their influence to corrupt the pay-setting process. Specifically, we look to whether pay-related consultant dismissals are concentrated at firms with imperialistic CEOs or whether consultants are most responsive to shareholders when the board is empowered, objective, and independent. We use four corporate governance proxies to capture the board's power dynamics and oversight intensity: board independence, co-opted boards, CEO/chairman duality, and CEO tenure.

When the board consists of independent directors without compromising ties to management, they are more likely to look out for shareholders (Weisbach, (1988), Dahya and McConnell (2007), Cai, Xu, and Yang (2021)). With respect to co-opted boards, Coles, Daniel, and Naveen (2014) argue that directors appointed under a given CEO's tenure feel beholden to that CEO for their board seat. Similar to independence, the fewer board members co-opted by the CEO (i.e., the CEO's tenure exceeds that of the director's), the more likely the board represents shareholders. If the CEO is not the chairman of the board, the CEO has less direct influence over board decisions (Jensen, 1993). Shorter tenured CEOs arguably have less power than longer serving, possibly entrenched, managers (Berger, Ofek, and Yermack (1997), Pan, Wang, and Weisbach (2016)). Boards that do not operate under such imperialistic CEOs are also more likely to represent the shareholders. The combined literature suggests that board power is stronger and the monitoring quality is better in the following subsets of firms: those with more independent boards, fewer directors co-opted by the CEO, those where the CEO is not the chairman, and those where the CEO has a shorter tenure.

In Table 5, we re-estimate the regression from equation (1), but with sample splits on the four governance variables: median level of board independence, whether 50% of the board is co-

opted by the CEO, whether the CEO is also the chairman of the board, and the median of CEO tenure. Given that the result in Table 4 is consistent with consultants recommending pay packages that support shareholder goals, we expect the positive and significant coefficient for positive abnormal pay to be concentrated in firms with strong governance. Panel A of Table 5 reports results of regressions using the abnormal pay variable split on its positive and negative components and Panel B considers the size of the recommendation errors and reports regressions using the large positive and large negative versions of these variables.

[Table 5]

Columns 1 and 2 of Panel A present results for the sample split on the median of board independence. The coefficient on positive abnormal pay is positive and significant when the board has a greater level of independence. When the board is below the median level of independence, the coefficient is close to zero and insignificant. Similarly, we split by board co-option in Columns 3 and 4 of Panel A. Again, the coefficient on positive abnormal pay is positive and significant only when the board is not co-opted by the CEO. The coefficient in the subsample with a co-opted board is statistically insignificant. Columns 5 and 6 of Panel A present results for the sample split on whether the CEO is the chairman of the board. The coefficient on positive abnormal pay is again positive and significant. Lastly, when the CEO has a tenure below the median, the coefficient on positive abnormal pay is positive and significant and insignificant when the CEO has had a long tenure. We see greater separation among the governance regimes when we split abnormal pay into its large positive and large negative components (Table 5, Panel B). The coefficients are not statistically significant in any of the four governance splits that we identify as having weak governance. The negative component of abnormal pay is not significant in any specification. Thus, under all four governance splits, in the

strong governance sample (i.e., strong board / shareholder power), the positive component of abnormal pay is positive and significant.

Together, the results in Table 5 are consistent with the argument that consultants are most likely to be punished for inappropriately high pay recommendations when the board is clearly in control. On each sample split, the positive result is stronger when shareholders have more power ensconced in the board and insignificant when the manager is likely to have more power. Combined with previous results, evidence supports the idea that firms are more likely to change their consultant when the CEO is excessively paid and their board is attentive. However, when the locus of control centers on management, the consultant is less likely to be disciplined for recommending high pay to the CEO.

C. Peer Group Changes Resulting from Consultant Changes

We next investigate the channel through which consultant changes can influence remuneration decisions by examining changes in the compensation peer group. On average, firms change their compensation peer groups in some fashion 57% of the time.[26] Prior research demonstrates that peer group constituents are a first-order determinant of executive compensation (Bizjak et al. (2008), Bizjak et al. (2011), Albuquerque, De Franco, and Verdi (2013), Cadman and Carter (2014)). One of the primary duties of the compensation consultant is to advise on the appropriate formulation of the peer group. Therefore, if firms change the consultant following excessive CEO pay levels, we expect the peer group composition would change in response to the disciplinary turnover. If the peer group composition is affected by consultant changes, it provides supportive evidence that consultant switches motivated by abnormally large CEO pay meaningfully impact future pay packages.

[26] Peer group changes include increasing or decreasing the number of companies within the peer group as well as changing any of the companies within the peer group from the prior year but keeping the total number of companies the same.

We investigate whether consultant changes are associated with changes in the firm's peer group. The OLS regression is of the following form:

(2) $$Change\ in\ Peer\ Group_{t,t-1} = \alpha + \beta_1 Consultant\ Change_{t,t-1} + \beta_2 Recommendation\ Error_{t-1} + \beta_3 Consultant\ Change_{t,t-1} \times Recommendation\ Error_{t-1} + \beta_4 \Delta Firm\ Characteristics_{t,t-1} + \beta_5 \Delta Governance\ Variables_{t,t-1} + \beta_6 \Delta Consultant\ Variables_{t,t-1} + Year\ FE + Industry\ FE + \varepsilon$$

where the dependent variable is an indicator variable that takes the value of one when the peer group has changed and zero otherwise. The primary variable of interest is the interaction between consultant changes and the consultant's pay recommendation error. As a first pass, we utilize the linear abnormal pay estimate as it is most consistent with the previous literature's depiction of the repeat business conflict. A negative interaction coefficient (β_3) would suggest firms are more likely to change peer groups following a consultant change when the CEO was overpaid, while a positive coefficient would suggest CEOs use their influence to retain more generous consultants. Changes in firm characteristics and governance variables are used where appropriate. Given the results we find in Table 4 and 5 that the repeat business motivation may be an incentive instead of a conflict, we again bifurcate abnormal pay into its positive and negative components and then use indicator variables for whether there are large positive or large negative recommendation errors. Each model uses industry and year fixed effects to absorb any time or industry invariant unobserved heterogeneity. Standard errors are clustered at the firm level.

[Table 6]

Results are presented in Table 6. Column 1 indicates no relation between consultant changes and peer group changes. This is to be expected. One should only expect a peer group change if the existing one is inappropriate (i.e., the CEO is over- or underpaid). Interestingly,

abnormal pay is also insignificant. This indicates the peer group is not significantly more likely to change even if the pay is inappropriate, but there is no catalyst to alter the peer group composition (i.e., as there would be if the consultant was replaced because pay was inappropriate).

Our next set of tests explore that catalyst, namely the firing of a consultant and the hiring of another. In Columns 2-4 we focus on the interaction between consultant changes and abnormal pay to isolate cases where pay is both inappropriate and there is an impetus to action. Specifically, we examine the interaction between consultant changes and abnormal pay (Column 2) as well as consultant changes and positive and negative abnormal pay (Column 3). The coefficient on the interaction between consultant changes and positive abnormal pay is positive and statistically significant at the 5% level. The result continues to hold when examining large positive abnormal pay firms (Column 4). These findings suggest a new consultant is more likely to change the peer group when the CEO was previously overpaid. We do not find compelling evidence that peer groups are modified following negative abnormal pay. We know empirically that abnormal compensation is persistent, therefore there is some concern that the peer group recommended by the incoming consultant (and the resulting pay package) may be partially determined by the previous one. We caution the reader that our estimation of equation (2) may suffer from a joint determination problem, so we take this evidence as suggestive rather than necessarily causal.

While a change in the peer group is notable, it is more informative to identify in what meaningful ways the peer group changed. Compensation consultants typically employ a compensation peer group to examine the executive pay of other similar firms as a benchmark. Bizjak et al. (2008) note peer group selection can have a significant impact on CEO pay.

Therefore, we examine how peer pay changes when the compensation consultant is dismissed, and the CEO was previously overpaid. Accordingly, we run the next regressions on the subset of firm-years (1,296) where a consultant change occurred to examine how the average pay level of the peer group changes. Specifically, we estimate the following:

(3) $Change\ in\ Peer\ Group\ Compensation_{t,t-1} = \alpha + \beta_1 Recommendation\ Error_{t-1} + \beta_4 \Delta Firm\ Characteristics_{t,t-1} + \beta_5 \Delta Governance\ Variables_{t,t-1} + \beta_6 \Delta Consultant\ Variables_{t,t-1} + Year\ FE + Industry\ FE + \varepsilon$

The two dependent variables examine the change in average peer salary and bonus compensation and peer total compensation. Bizjak et al. (2011) find peer group biases result from picking benchmark CEOs who earn higher pay, especially for non-S&P 500 firms. As such, we use indicators for whether the new peer group's average salary and bonus (*Salary + Bonus Larger*$_{t,t-1}$) or total compensation (*Total Comp Larger*$_{t,t-1}$) is larger than the prior year.

[Table 7]

The results of this estimation are in Table 7. For each peer compensation indicator variable, abnormal pay variable is negative but insignificant (Columns 1 and 4). However, when we split the consultant's recommendation error into its positive and negative components, the positive abnormal pay variable is negative and statistically significant beyond the 5% level. Similar results are obtained when we use the *Large Positive Abnormal Pay* indicator. The marginal effect implies that a prior large positive recommendation error decreases the likelihood of a higher paid peer group by 6.82%. The coefficient on negative (and large negative) abnormal pay is not statistically significant for total pay but is positive and significant for salary and bonus. These findings indicate incoming consultants avoid highly compensated peers when advising a CEO who was previously overpaid. Taken together, the results provide corroborative evidence

that new consultants meaningfully change the compensation peer group, perhaps, to bring CEO pay back in line when the prior consultant recommended too much pay.

[Table 8]

D. The Effect of Consultant Dismissals on Subsequent CEO Pay

After examining the determinants of the choice to change consultants and how peer groups evolve following consultant changes, we examine the actual impact on CEO pay after a consultant switch has occurred.[27] We estimate an OLS regression of the following form:

$$(4)\ Change\ in\ Total\ Pay_{t,t-1} = \alpha + \beta_1 Consultant\ Change_{t,t-1} + \beta_2 Recommendation\ Error_{t-1} + \beta_3 Consultant\ Change_{t,t-1} \times Recommendation\ Error_{t-1} + \beta_4 \Delta Firm\ Characteristics_{t,t-1} + \beta_5 \Delta Governance\ Variables_{t,t-1} + \beta_6 \Delta Consultant\ Variables_{t,t-1} + Year\ FE + Industry\ FE + \varepsilon$$

where the dependent variable is the change in total CEO pay from year *t-1* to year *t*. The remaining variables are the same as those in equation (3).

We report the findings in Table 8. Column 1 uses the continuous abnormal pay variable to indicate the consultant's recommendation error. Column 2 uses the previous split of abnormal pay into positive and negative values and Column 3 uses the large positive and large negative indicator variables. The primary variable of interest is the interaction between a change in consultant and the recommendation error proxy in each model. The interaction of the indicator variable in Column 2 can be interpreted as the impact of switching consultants on the change in CEO pay when the CEO has previously been overpaid. Column 3 is similarly the impact for CEOs who were previously grossly over or underpaid. For the specifications using the continuous variables (Columns 1 and 3), the interaction reveals whether the effect of changing consultants on the change in CEO pay depends on the level of abnormal CEO pay.

[27] The choice to use total pay as the dependent variable rather than abnormal pay is deliberate for two reasons: 1) while abnormal pay is observable to the researcher and marketplace ex-post, it is unlikely available to the board ex-ante at the time pay is set and 2) boards firing a consultant for overpaying may further seek absolute pay declines rather than relative declines (which could still actually be absolute pay increases).

In all specifications, the interaction variable is negative and statistically significant. This negative estimate implies that when the CEO is overpaid and the firm switches consultants, subsequent CEO pay decreases. In terms of economic magnitude, for every one million dollars of abnormal CEO pay in the previous year, the CEO's total compensation the following year decreases by approximately $445,000. However, when the firm changes compensation consultants following periods of excessive pay, the CEO's total compensation is reduced by another $135,500. Together, this represents a total decrease in pay for the CEO of $580,500. This evidence is consistent with compensation consultants supporting shareholder desires.

There are two additional important findings. First, the coefficient on consultant change is not significantly different from zero when the CEO is underpaid (Columns 2 and 3). Second, when the interaction is removed, the coefficient on change in consultant is not statistically significant (untabulated). The effect of changing consultants on subsequent CEO pay appears to be driven primarily by when the CEO is excessively paid. If consultants serve shareholders by formulating appropriate pay recommendations, then any deviation from optimal pay would trigger a consultant switch and subsequent correction. As argued earlier, this effect should be more prevalent when the CEO is excessively paid. Shareholders typically do not complain about an underpaid CEO (despite CEO retention risks); however, the opposite commonly occurs for overpaid executives.

Our control variable estimates are omitted to conserve space, but they are in line with prior research. Higher stock returns and positive changes in firm size are associated with increases in CEO pay (Gabaix and Landier (2008)). Consistent with Grinstein and Hribar (2004) and Fich, Starks, and Yore (2014), corporate deal-making is also associated with increases in

CEO pay. Increases in leverage lead to declines in pay (Gilson and Vetsuypens (1993), John and John (1993)).

Overall, results from Table 8 lend support for consultants recommending appropriate pay, especially when replacing a prior advisor who recommended overly generous compensation. Regardless of the specification, the interactions between the change in consultant and the abnormal pay variables are negative and significant. This finding implies that when a firm changes its compensation consultant following excess CEO pay, CEO pay declines in the subsequent year.

E. Shareholder Support for Compensation Consultant Changes

Finally, we turn to out-of-sample evidence to confirm our results regarding consultant switches by examining outcomes in director elections. Shareholders express their approval or disapproval of the compensation committee when they vote upon their members at the annual meeting. Therefore, we examine the number of "for" votes the committee member receives in the year following a compensation consultant change. Provided the consultant change aligns the CEO's incentives to the shareholders' best interests, investors should show support for the board following the change and vote "for" the directors to continue in office. Conversely, if the compensation consultant change is primarily motivated by management looking to obtain excess pay, then shareholders will show their displeasure by withholding votes.

[Table 9]

Using a sample of 20,242 director votes from the ISS Voting Analytics database, we estimate the following model:

(5) $Percentage\ Change\ in\ DirectorVotes_{t+1,t} = \alpha + \beta_1 Consultant\ Change_t + \beta_2 Compensation\ Committee\ Member_t + \beta_3 Consultant\ Change_t \times$

$$Compensation\ Committee\ Member_t + \beta_4 Director\ Characteristics_t + B_5 Firm/Governance\ Characteristics_t + Year\ FE + Firm\ FE + \varepsilon$$

where $Percentage\ Change\ in\ DirectorVotes_{t+1,t}$ is the change in the percentage of "for" votes for directors the year after a consultant change and $CompCommittee$ indicates whether the director is on the compensation committee. Additional control variables follow the Cai, Garner, and Walkling (2009) and Field, Souther, and Yore (2020) for *Director Characteristics* (i.e., work experience, education, and ISS support) and *Firm / Governance Characteristics* (i.e., firm size, profitability, governance characteristics, executive pay, and litigation or accounting irregularities). All specifications include meeting clustered standard errors with firm and year fixed effects. Because compensation committee members play a more significant role in CEO compensation, we focus on the effect for these directors in Column 2. Results are tabulated in Table 9.

In the year following a change in compensation consultants, the directors on the compensation committee receive an additional 0.48% increase in votes (Column 2). Further, we replace *Compensation Committee Member*$_t$ variable with two different indicator measures of CEO compensation (*CEO Overpaid*$_t$ and *Decrease in Abnormal CEO Pay*$_t$) to explore shareholders' reactions to a compensation consultant change when the CEO was previously overpaid (Column 3) or if the change results in a subsequent decrease in CEO abnormal pay (Column 4). In both instances, shareholders reward directors for changing consultants due to excessive pay with more "for" votes. For example, directors receive a 5.3% increase in the percent of "for" votes when the CEO was previously overpaid and the firm changes consultants. Overall, we show evidence of a direct consequence for directors when the company changes compensation consultants. Compensation committee members garner more shareholder approval when changes are made following excessive CEO pay.

V. Conclusions

Revenue-minded compensation consultants are concerned with earning repeat business. We question whether this concern creates a conflict of interest or an added incentive. If consultants are influenced by management's desire to earn excess pay, the repeat business motive is a conflict. Recommending low pay risks dismissal by the CEO if they are, in fact, in control of this decision. However, if the power to retain resides with the board, the repeat business motive is actually a mechanism that aligns advisors' interests with shareholders' to recommend the appropriate pay.

In this paper, we empirically test whether compensation consultants are evaluated (and retained) based on their ability to recommend appropriate CEO pay. When consultants work solely in shareholders' interests, they should be rewarded repeat business for recommending proper pay. However, we investigate scenarios where the CEO might exert their power over the retention decision to influence those pay recommendations. To test, we utilize a definitive event that speaks directly to whether the consultant earned repeat business: consultant turnover. We exploit variation in CEO power and board attentiveness to shed further light on the consultant's motives.

We find consistent evidence that the board appears to drive compensation consultant dismissals. Firms change consultants following excessive levels of CEO pay, especially when boards are strong and when the recommendation error is large. When the CEO has been paid excessively and a consultant switch occurs, new advisors avoid highly paid peer executives. CEO pay declines the following year. In addition, we find evidence directors benefit from a change in compensation consultants by receiving more shareholder votes at the annual meeting.

Overall, our results suggest the criticism of the compensation consultant industry may be overstated.

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Appendix A

Source, definition, and construction of all variables used in analysis.

Variable	Database	Description
# of Consulting Firms per Industry	DEF 14-A	The total number of compensation consulting practices available per industry using one-digit SIC codes at the beginning of the fiscal year.
% Board Independent	ISS(RiskMetrics)	Percentage of Board that is listed as Independent in the RMDirectors Set (Classification="I")
% Institutional Ownership	13-F Filings	Percentage of common stock held by institutions from Thompson Reuters.
% Outsider Board Co-opted	ISS(RiskMetrics)	The percentage of outside directors who have a shorter tenure than the CEO
% Outsider Busy Board	ISS(RiskMetrics)	The percentage of outside directors who hold 3 or more directorships
Abnormal Pay	EXECUCOMP	Following Yermack (2006), we estimate abnormal grant-date total CEO compensation (TDC1) from a calendar year cross-sectional regression and then calculate abnormal pay as the residual. $Total\ Compensation_{i,t} = \alpha + \beta_1 \ln(Sales)_t + \beta_2 CEO\ Tenure_t + \beta_3 Abnormal\ Stock\ Return_t + Industry\ FE + \varepsilon$ *Abnormal Pay = Actual Total Compensation - Predicted Total Compensation* where $Sales_{i,t}$ is net sales in millions for firm *i* at time *t*, and $CEO\ Tenure_{i,t}$ is the total number of years the current CEO has served in that role at the company. $Abnormal\ Stock\ Return_{i,t}$ is the net of market model cumulative abnormal stock returns for the fiscal year, where a value greater than zero reflects a CEO that is paid higher than predicted.
Absolute Value of Abnormal Pay	EXECUCOMP	The absolute value of abnormal pay calculated above.
Absolute Value of Abnormal Pay Q1	EXECUCOMP	Equals 1 if the pay falls within the smallest quartile (Q1) of the absolute value of abnormal pay as calculated above.
Absolute Value of Abnormal Pay Q2	EXECUCOMP	Equals 1 if the pay falls within the second lowest quartile (Q2) of the absolute value of abnormal pay as calculated above.
Absolute Value of Abnormal Pay Q3	EXECUCOMP	Equals 1 if the pay falls within the third quartile (Q3) of the absolute value of abnormal pay as calculated above.
Absolute Value of Abnormal Pay Q4	EXECUCOMP	Equals 1 if the pay falls within the largest quartile (Q4) of the absolute value of abnormal pay as calculated above.
Academic Experience	ISS/BoardEx	Equals 1 if has academic experience in either ISS or BoardEx
Accounting Restatement	Audit Analytics	Equal to 1 if the earnings are restated.
Advanced Graduate Degree	ISS/BoardEx	Equals 1 if has master's degree or PhD in either ISS or BoardEx
Board Size	ISS(RiskMetrics)	Number of board members reported by firm-year in RMDirectors
CEO Age	EXECUCOMP	CEO Age (in years)
CEO Chairman	ISS(RiskMetrics)	Equal to 1 if for a given firm-year, a director has both Employment_CEO=1 and Employment_Chairman=1
CEO Overpaid	EXECUCOMP	Equal to 1 if abnormal pay is positive
CEO Tenure	EXECUCOMP	Estimated tenure of CEO (years) based on years in Execucomp database.
CEO Turnover	EXECUCOMP	Equal to 1 if there was CEO turnover in fiscal year t
Change in Consultant	DEF 14-A	Equal to 1 if the firm's consultant has changed in any of the following 3 ways: 1) Firm switches from using one consultant to using another 2) Firm uses no consultant the previous year and uses at least one in current year (includes going from 1 to 2 consultants) 3) Firm uses a different number of consultants in year (t) compared to year (t-1).
Change in Peer Group	DEF 14-A	Equal to 1 if the compensation peer group changes in any way from the previous year.
Change in Total Pay	EXECUCOMP	The change in CEO's total pay from the prior fiscal year.
Classified Board	ISS(RiskMetrics)	Equal to 1 if firm has a classified board (CBOARD="YES" or "1")
Compensation Committee Member	ISS(RiskMetrics)	Equal to 1 if the director is part of the firm's compensation committee.
Confidential Voting	ISS(RiskMetrics)	Equal to 1 if the firm has confidential voting.
Debt to Assets	COMPUSTAT	Long Term debt to Total Assets
Decrease in Abnormal CEO pay	EXECUCOMP	Equal to 1 if the CEO's abnormal pay decreased from the previous year's compensation.
Director Network	BoardEx	Average size of the board of directors' network.
Dual Class Firm	ISS(RiskMetrics)	Equal to 1 if firm has dual class shares (DUALCLASS="YES" or "1")
Equity	EXECUCOMP	Sum of Option and Stock awards (OPTION_AWARDS_FV+STOCK_AWARDS_FV)
Extra-Regional CPI	BLS	The U.S. Bureau of Labor Statistics produces a Consumer Price Index (*Regional CPI*) for four different regions (Northeast, Midwest, West, and South) and for the entire U.S. (*National CPI*). We orthogonalize the National CPI to the Regional CPI for the company's headquarters by taking the residual from a time-series regression of National CPI on the firm headquarters' Regional CPI.
Finance Experience	ISS/BoardEx	Equals1 if has finance experience in either ISS or BoardEx

Industry Adjusted Total Pay	EXECUCOMP	Current Total Pay (TDC1) minus the average pay of the Fama-French 48 Industry for full EXECUCOMP database with available data.
Industry Specialist	DEF 14-A	Firm whose largest industry share is at least one standard deviation larger than its second largest industry. In the case of multiple consultants, the max value is used.
Large Negative Abnormal Pay	EXECUCOMP	Equal to 1 if the abnormal pay is above the median for positive abnormal pay.
Large Positive Abnormal Pay	EXECUCOMP	Equal to 1 if the abnormal pay is above the median for negative abnormal pay.
Legal or Consulting Experience	ISS/BoardEx	Equal to1 if has legal/consulting experience in either ISS or BoardEx
Litigation	Stanford SCACs	Equal to 1 if the firm was targeted with a class action lawsuit during the fiscal year.
Log of Abnormal Pay	EXECUCOMP	Following Yermack (2006) model but estimating the log of total compensation.
Majority Vote Requirement	ISS(RiskMetrics)	Equal to 1 if director elections have a majority vote provision.
Market-to-Book	COMPUSTAT	PRCC_F*CSHO/CEQ
MBA Degree	ISS/BoardEx	Equal to1 if has MBA in either ISS or BoardEx
Merger	SDC	Equal to 1 if the firm initiated a merger during the given year.
Military Experience	ISS/BoardEx	Equal to 1 if has military experience in either ISS or BoardEx
Multiple Consultants	DEF 14-A	Equal to 1 if the firm hires more than 1 consultant in a given year
Multi-Service	DEF 14-A	Consultant firm provides other services in addition to compensation advisory services following Chu et. al (2018). In the case of multiple consultants, the max value is used.
Negative Abnormal Pay	EXECUCOMP	A continuous variable that equals 0 if abnormal pay is positive, otherwise the variable is the calculated negatively signed abnormal compensation amount.
New Peer Group Salary + Bonus Larger	EXECUCOMP	Equal to 1 if the average CEO's salary plus bonus of the firm's new compensation peer group is larger than the prior fiscal year's peer group.
New Peer Group Total Compensation Larger	EXECUCOMP	Equal to 1 if the average CEO's total compensation of the firm's new compensation peer group is larger than the prior fiscal year's peer group.
Non-timely SEC Filing	Audit Analytics	Equal to 1 if the filing is late.
Number of analysts	I/B/E/S	Number of analysts covering the firm in each fiscal year
Other Pay	EXECUCOMP	Total Pay - Salary - Bonus - Equity
Percentage Change in Director Votes	ISS Voting Analytics	The change in the percentage of "for" votes a director receives from the previous year.
Poison Pill	ISS(RiskMetrics)	Equal to 1 if the firm has a poison pill in place.
Political Experience	ISS/BoardEx	Equal to 1 if has political experience in either ISS or BoardEx
Positive Abnormal Pay	EXECUCOMP	A continuous variable that equals 0 if abnormal pay is negative, otherwise the variable is the calculated positively signed abnormal compensation amount.
Residual ISS Vote 'For' Rec	Various	Residual from a LPM model following Table 5 in Field, Souther, and Yore (2020).
Return on Assets	COMPUSTAT	NI/AT
Salary + Bonus	EXECUCOMP	Salary (SALARY) + Bonus (BONUS)
Stock Return	CRSP	Fiscal year buy-and-hold stock return net of the CRSP value-weighted index return.
Total Assets	COMPUSTAT	Total Assets (AT)
Total Director Ownership	ISS(RiskMetrics)	The total amount of shares the director owns.
Total Pay	EXECUCOMP	Total CEO compensation, as reported (TDC1)
Undergrad Degree	ISS/BoardEx	Equal to 1 if has bachelor's degree in either ISS or BoardEx
Unequal Voting Rights	ISS(RiskMetrics)	Equal to 1 if the firm has dual class shares.

TABLE 1
Usage of Compensation Consultants, 2007-2014

Table 1 presents descriptive statistics by year for firms in our sample that use compensation consultants, as reported in their DEF14-A proxy statements. The sample consists of all firms in the S&P 500 or S&P 400 that use a compensation consultant at any point in the sample period. The table presents the number of firms per year that change consultants, who engages the compensation consultant and the number of consultants retained. The Internet Appendix provides further details regarding how firms switch between compensation consultants and defines each variable.

Panel A: Consultant Engagement	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**All**
Total Firms	536	818	812	794	830	818	817	805	6,230
# Firms that Change Consultants	126	136	257	307	157	96	126	91	1,296
% Firms that Change Consultants	23.5%	16.6%	31.7%	38.7%	18.9%	11.7%	15.4%	11.3%	20.8%
% Hired by Board	84.0%	84.2%	86.7%	89.4%	90.5%	91.8%	93.4%	94.0%	**89.5%**
% Hired by Management	11.6%	11.7%	10.2%	7.8%	6.1%	5.0%	3.8%	3.7%	**7.3%**
% Unclear	4.5%	4.0%	3.1%	2.8%	3.4%	3.2%	2.8%	2.2%	**3.2%**
% Firms Hiring One Consultant	91.0%	91.2%	89.0%	88.7%	89.4%	90.2%	90.5%	89.2%	89.9%
% Firms Hiring Two Consultants	7.6%	7.5%	10.2%	10.7%	10.1%	9.2%	8.9%	10.1%	9.4%
% Firms Hiring Three+ Consultants	1.3%	1.3%	0.7%	0.6%	0.5%	0.6%	0.6%	0.7%	0.8%
% Divided Firms	5.4%	5.0%	5.6%	6.1%	6.1%	6.1%	6.0%	5.6%	**5.6%**

TABLE 2

Top-15 Compensation Consultants

Table 2 presents the top-15 compensation consultants hired by year. Pay Governance, Meridian, and Compensation Advisory Partners are specialist consultants (meaning they only offer compensation consulting services) that were spun off by their parent firms Towers Watson, Aon Hewitt, and Mercer, respectively. The first three columns present the average market share for each consultant for each time period. The next column states whether the consultant is an industry specialist. An industry specialist is a consulting firm whose largest industry share is at least one standard deviation larger than its second largest industry. All remaining consultant firms are considered generalists. The last three columns present whether the firm is a single-service (provides only compensation advisory services) or multi-service firm following Chu et. al (2018), the number of offices, and whether the firm has an international presence. Each variable is defined in Appendix A.

Top 15 Consultant Firms	**2007-2010**	**2011-2014**	**All**	**Industry Specialist**	**Single or Multi**	**# US Offices**	**International**
Towers Watson and Predecessors	23.58%	9.48%	16.10%	No	Multi	112	Yes
Pay Governance	2.05%	9.10%	5.30%	No	Single	14	Yes
Aon Hewitt and Predecessors	12.83%	5.25%	8.70%	No	Multi	105	Yes
Meridian	2.55%	8.70%	5.20%	No	Single	10	Yes
Frederic W. Cook	15.98%	21.68%	19.10%	Yes	Single	7	No
Mercer	9.93%	5.13%	7.30%	Yes	Multi	69	Yes
Compensation Advisory Partners	1.40%	2.85%	1.90%	No	Single	2	No
Pearl Meyer	6.08%	8.53%	7.40%	Yes	Single	8	Yes
Semler Brossy	2.50%	4.35%	3.50%	No	Single	2	No
Compensia	2.75%	4.10%	3.50%	Yes	Single	2	No
Exequity	1.45%	3.68%	2.60%	No	Single	3	No
Hay Group	1.60%	1.65%	1.60%	Yes	Multi	11	Yes
Steven Hall & Partners	0.88%	1.75%	1.30%	Yes	Single	1	No
FPL Advisors	0.85%	1.35%	1.10%	Yes	Single	3	Yes
Deloitte	1.28%	0.90%	1.10%	No	Multi	110	Yes
% of Total	82.75%	88.43%	85.70%				

TABLE 3

Descriptive Statistics

In Table 3 we present descriptive statistics for the universe of firms listed in the S&P 500 or S&P 400 indices that have ever hired a pay advisor with complete data for the 2007-2014 period. Panel A presents firm characteristics, panel B presents compensation and CEO variables, and panel C presents Board Characteristics. Variables are calculated using data from Compustat, CRSP, EXECUCOMP, and ISS (Riskmetrics). All variables are described in Appendix A. Total Assets and all compensation variables are reported in millions.

Panel A: Firm Characteristics	Mean	Std Dev	Q1	Median	Q3
Total Assets	24,634	67,625	2,494	5,944	16,883
Market-to-Book	3.0297	2.9737	1.4216	2.1953	3.4899
Return on Assets	0.0539	0.0653	0.0205	0.0497	0.0871
Stock Return	0.0459	0.3075	(0.1475)	0.0141	0.1919
Debt to Assets	0.2339	0.1643	0.1047	0.2184	0.3407
Merger	0.2053	0.4040	0.0000	0.0000	0.0000

Panel B: Compensation Variables	Mean	Std Dev	Q1	Median	Q3
Salary & Bonus	1.16	0.83	0.79	0.99	1.21
Equity	4.56	4.20	1.74	3.51	6.28
Other Pay	1.84	2.03	0.58	1.29	2.36
Total Pay	7.63	5.73	3.76	6.17	9.78
Abnormal Pay	8.77	4.33	-2.32	-0.62	1.46
Positive Abnormal Pay	1.52	3.43	0.00	0.00	1.47
Negative Abnormal Pay	-1.48	1.93	-2.41	-0.67	0.00
Absolute Value of Abnormal Pay	3.00	3.32	0.97	2.08	3.83
Industry-Adjusted Total Pay	3.78	5.60	1.75	2.30	5.85
CEO Age	56.26	6.29	52.00	56.00	60.00
CEO Tenure	7.86	6.75	3.00	6.00	10.41
CEO Turnover	0.10	0.30	0.00	0.00	0.00

Panel C: Board Characteristics	Mean	Std Dev	Q1	Median	Q3
Classified Board	0.39	0.49	0.00	0.00	1.00
Dual Class Firm	0.04	0.20	0.00	0.00	0.00
Board Size	10.00	2.08	9.00	10.00	11.00
% Board Independent	81.46	9.61	75.00	83.33	90.00
CEO Chairman	0.53	0.50	0.00	1.00	1.00
% Outsider Busy Board	29.02	19.55	14.29	28.57	42.86
% Outsider Board Co-opted	46.89	33.66	18.18	42.86	75.00

TABLE 4

The Effect of CEO Pay on Compensation Consultant Turnover

Table 4 presents regression results that estimate the effect of a recommendation error on CEO pay on the likelihood of compensation consultant turnover for the universe of firms listed in the S&P 500 or S&P 400 indices that have ever hired a pay advisor with complete data for the 2007-2014 period. In Panel A, the dependent variable is an indicator of whether the firm changed compensation consultants (*Change in Consultant*) in the fiscal year. The key independent variable of interest in Column 1 is the level of abnormal CEO pay. Column 2 uses the absolute value of abnormal CEO pay as a recommendation error measure. In Column 3 the absolute value of abnormal pay is separated into quartiles with Q4 representing the largest recommendation errors both positive and negative. In Column 4 abnormal pay is bifurcated into its positive or negative components. Column 5 focuses on the largest recommendation errors by indicating the largest positive abnormal pay errors and the largest negative abnormal pay errors, which are above the respective medians. All columns utilize the same controls. In Panel B, we use an instrumental variable approach to address endogeneity issues surrounding abnormal pay. The first stage uses the national CPI orthogonalized to the regional level of the consumer price index (Extra-Regional CPI) as the instrumental variable for abnormal pay (dependent variable). The second stage uses the instrumented version of abnormal pay in the same regressions as Panel A, columns 1 (abnormal pay), 4 (positive abnormal pay), and 5 (continuous large positive abnormal pay, which is the value of abnormal pay for those values exceeding the median positive abnormal pay level). In Panel C, a logit regression using the variables in Panel A is used to predict the propensity scores for each firm as to whether they have a specific type of recommendation error (the treatment firms). Using a nearest neighbor with common support and a caliper width of 0.001 approach, the treatment firms are matched to control firms and the likelihood of a consultant dismissal is analyzed. Panel D reports a subsample analysis using the columns 1 and 4 specifications from Panel A. The regression is run first on the 2007-2008 subsample and then on the 2011-2014 subsample. Variables indexed time "t" are computed as of the current fiscal year, while "t-1" are lagged one period. Pay variables are in millions. All regressions include year and industry fixed effects using the Fama-French 48 classification. We report standard errors in parentheses using robust (Rogers, 1993) standard errors clustered by firm. Variables are defined in Appendix A.

Panel A: Abnormal Pay and Changes in Compensation Consultants

Dep Var: Change in Consultant$_t$	1	2	3	4	5
Abnormal Pay$_{t-1}$	0.0091**				
	(0.004)				
Absolute Value of Abnormal Pay$_{t-1}$		0.0165***			
		(0.006)			
Abs. Value of Abnormal Pay Q2$_{t-1}$			0.0054		
			(0.052)		
Abs. Value of Abnormal Pay Q3$_{t-1}$			0.0700		
			(0.055)		
Abs. Value of Abnormal Pay Q4$_{t-1}$			0.1192**		
			(0.058)		
Positive Abnormal Pay$_{t-1}$				0.0172***	
				(0.006)	
Negative Abnormal Pay$_{t-1}$				-0.0091	
				(0.011)	
Large Positive Abnormal Pay$_{t-1}$					0.1482***
					(0.053)
Large Negative Abnormal Pay$_{t-1}$					0.0511
					(0.047)
Industry Specialist$_{t-1}$	-0.4935***	-0.4895***	-0.4901***	-0.4901***	-0.4916***
	(0.054)	(0.054)	(0.054)	(0.054)	(0.054)
Multi-service$_{t-1}$	0.1472***	0.1525***	0.1487***	0.1526***	0.1483***
	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)

Panel A (continued)

Multiple Consultants$_{t-1}$	0.7841***	0.7859***	0.7881***	0.7844***	0.7857***
	(0.066)	(0.066)	(0.066)	(0.066)	(0.066)
Number of analysts$_{t-1}$	-0.0044	-0.0037	-0.0036	-0.0039	-0.0042
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
% Institutional Ownership$_{t-1}$	-0.0393	-0.0329	-0.0269	-0.0360	-0.0347
	(0.095)	(0.095)	(0.096)	(0.096)	(0.095)
Market to Book$_{t-1}$	-0.0000	0.0002	0.0007	-0.0001	-0.0000
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Return on Assets$_{t-1}$	0.1645	0.1584	0.1554	0.1626	0.1626
	(0.354)	(0.354)	(0.354)	(0.354)	(0.354)
Stock Returns$_{t-1}$	-0.1646***	-0.1583**	-0.1548**	-0.1607***	-0.1586**
	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)
Debt to Assets$_{t-1}$	0.0704	0.0831	0.0770	0.0828	0.0751
	(0.163)	(0.164)	(0.163)	(0.164)	(0.163)
Log Total Assets$_{t-1}$	0.0230	0.0134	0.0158	0.0143	0.0164
	(0.025)	(0.026)	(0.026)	(0.026)	(0.025)
CEO Age$_t$	-0.0085**	-0.0085**	-0.0084**	-0.0085**	-0.0085**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
CEO Tenure$_t$	-0.0014	-0.0019	-0.0020	-0.0018	-0.0017
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
CEO Turnover$_t$	-0.0966	-0.0985	-0.0977	-0.0984	-0.0979
	(0.071)	(0.071)	(0.071)	(0.071)	(0.071)
Dual Class Firm$_{t-1}$	-0.0665	-0.0682	-0.0683	-0.0686	-0.0690
	(0.111)	(0.110)	(0.109)	(0.110)	(0.110)
Board Size$_{t-1}$	0.0076	0.0077	0.0072	0.0078	0.0081
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
% Board Independent$_{t-1}$	-0.0012	-0.0008	-0.0008	-0.0008	-0.0010
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
% Outsider Busy Board$_{t-1}$	0.0014	0.0015	0.0015	0.0014	0.0014
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO Chairman$_{t-1}$	-0.1150**	-0.1057**	-0.1049**	-0.1085**	-0.1111**
	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)
Classified Board$_{t-1}$	0.0036	0.0053	0.0063	0.0051	0.0065
	(0.045)	(0.045)	(0.046)	(0.045)	(0.045)
% Outsider Board Co-opted$_{t-1}$	0.0006	0.0007	0.0007	0.0006	0.0007
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Director Network$_{t-1}$	-0.0044**	-0.0043*	-0.0042*	-0.0044**	-0.0043*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Merger$_{t-1}$	-0.0923*	-0.0910*	-0.0868*	-0.0919*	-0.0882*
	(0.051)	(0.052)	(0.051)	(0.052)	(0.052)
Constant	-0.4099	-0.4257	-0.4624	-0.4130	-0.4491
	(0.658)	(0.660)	(0.672)	(0.661)	(0.678)
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	6,230	6,230	6,230	6,230	6,230
Pseudo R-squared	0.119	0.119	0.119	0.119	0.119

Panel B: Instrumental Variable Regressions

	First Stage	Second Stage		
	DV: Abnormal Pay_{t-1}	DV: Change in Consultant		
		1	2	3
Extra-Regional CPI_{t-1}	-0.0355***			
	(0.007)			
Instrumented Abnormal Pay_{t-1}		0.0525***		
		(0.020)		
Instrumented Positive Abnormal Pay_{t-1}			0.1463**	
			(0.067)	
Instrumented Large Positive Abnormal Pay_{t-1}				0.1744*
				(0.091)
Firm and Consultant Controls	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes
First stage Cragg-Donald F-test statistic	25.33			
p-value	(0.00)			
Observations	6,230	6,230	6,230	6,230
R-squared / Pseudo R-squared	0.070	0.0663	0.0438	0.0755

Panel C: Propensity Score Matched (PSM) Sample Consultant Dismissal Rates

Sample Subgroup	Consultant Dismissal Rate		Difference	t-stat	p-value
	Treated Group	Control Group			
Absolute Abnormal Pay Q1 Firms	0.1991	0.2246	-0.0255	-1.49	(0.14)
Absolute Abnormal Pay Q2 Firms	0.1972	0.2152	-0.0180	-1.10	(0.27)
Absolute Abnormal Pay Q3 Firms	0.2115	0.2031	0.0084	0.51	(0.61)
Absolute Abnormal Pay Q4 Firms	0.2243	0.2044	0.0199	1.14	(0.25)
Positive Abnormal Pay Firms	0.2211	0.1956	0.0256	2.03	(0.04)
Negative Abnormal Pay Firms	0.2011	0.2185	-0.0174	-1.37	(0.17)
Large Positive Abnormal Pay Firms	0.2272	0.1731	0.0541	2.96	(0.00)
Large Negative Abnormal Pay Firms	0.2132	0.2094	0.0038	0.02	(0.81)

Panel D: Period Breakdown

	2007-2008		2011-2014	
	1	2	3	4
Abnormal Pay_{t-1}	0.0240*		0.0166**	
	(0.014)		(0.007)	
Positive Abnormal Pay_{t-1}		0.0102*		0.0306***
		(0.006)		(0.010)
Negative Abnormal Pay_{t-1}		-0.0378		-0.0198
		(0.043)		(0.016)
Additional Controls	Yes	Yes	Yes	Yes
Observations	1,338	1,338	3,226	3,226
Pseudo R-squared	0.1120	0.1130	0.0887	0.0906

TABLE 5
The Moderating Effect of Corporate Governance

Table 5 presents Probit regression results that estimate the effect of abnormal CEO pay on the likelihood of compensation consultant turnover when bifurcated by four different measures of corporate governance. The models are run on the universe of firms listed in the S&P 500 or S&P 400 indices that have hired a pay advisor with complete data for the 2007-2014 period. The dependent variable in each column is an indicator of whether the firm changed compensation consultants (*Change in Consultant*) in the fiscal year. Each column represents a subsample of firms with either strong or weak governance indicators. Panel A uses the separation of abnormal pay into positive and negative values and Panel B uses the identification of large positive and large negative recommendation errors. All specifications include the changes of the control variables listed in Table 4, Panel A, but are suppressed for brevity. Variables indexed time "t" are computed as of the current fiscal year, while "t-1" are lagged one period. Pay variables are in millions. All regressions include year and industry fixed effects using the Fama-French 48 classification. We report standard errors in parentheses using robust (Rogers, 1993) standard errors clustered by firm. Variables are defined in Appendix A.

Panel A: The Moderating Effect of Corporate Governance, Split by Positive and Negative Abnormal Pay

	Board Independence		Co-opted Board		CEO Chairman		CEO Tenure	
	High	Low	No	Yes	No	Yes	Short	Long
	1	2	3	4	5	6	7	8
Positive Abnormal Pay_{t-1}	0.0218***	0.0068	0.0257***	0.0035	0.0226***	0.0075	0.0274***	0.0035
	(0.009)	(0.008)	(0.010)	(0.008)	(0.010)	(0.008)	(0.010)	(0.007)
Negative Abnormal Pay_{t-1}	-0.0113	-0.0145	-0.0207	0.0021	-0.0187	0.0006	-0.0126	-0.0097
	(0.017)	(0.015)	(0.017)	(0.016)	(0.016)	(0.017)	(0.018)	(0.015)
Additional Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,184	3,028	3,207	3,003	2,956	3,266	3,104	3,107
Pseudo R-Squared	0.123	0.090	0.126	0.088	0.104	0.109	0.119	0.090

Panel B: The Moderating Effect of Corporate Governance, Split by Mistake Size Based on Abnormal Pay

	Board Independence		Co-opted Board		CEO Chairman		CEO Tenure	
	High	Low	No	Yes	No	Yes	Short	Long
	1	2	3	4	5	6	7	8
Large Positive Abnormal Pay_{t-1}	0.2558***	0.0321	0.2070***	0.0851	0.1609**	0.1300	0.1819**	0.0960
	(0.071)	(0.081)	(0.080)	(0.071)	(0.078)	(0.082)	(0.076)	(0.073)
Large Negative Abnormal Pay_{t-1}	0.0972	0.0357	0.0601	0.0477	0.0423	0.0803	0.0486	0.0634
	(0.071)	(0.064)	(0.067)	(0.070)	(0.066)	(0.069)	(0.067)	(0.067)
Additional Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,184	3,028	3,207	3,003	2,956	3,266	3,104	3,107
Pseudo R-Squared	0.141	0.114	0.143	0.115	0.125	0.136	0.148	0.107

TABLE 6
The Influence of Consultant Changes

Table 6 presents Probit regression models estimating the impact of a consultant change on compensation peer group changes. The models are run on the universe of firms listed in the S&P 500 or S&P 400 indices that have hired a pay advisor with complete data for the 2007-2014 period. The dependent variable in each column is an indicator of whether the firm's compensation peer group changed in the fiscal year. Columns 1 and 2 use abnormal pay as the main recommendation error variable. Column 3 uses the separation of abnormal pay into positive and negative values and Column 4 uses the large positive and large negative abnormal pay indicators. All specifications include the changes of the control variables listed in Table 4, Panel A (where appropriate), but are suppressed for brevity and all variables are defined in Appendix A. Variables indexed time "t" are computed as of the current fiscal year, while "t-1" are lagged one period. Pay variables are in millions. All regressions include year and industry fixed effects using the Fama-French 48 classification. We report standard errors in parentheses using robust (Rogers, 1993) standard errors clustered by firm.

Dependent Variable: Change in Peer Group$_t$	1	2	3	4
Change in Consultant$_t$	0.0060	0.0066	0.0095	0.0133
	(0.016)	(0.016)	(0.024)	(0.024)
Abnormal Pay$_{t-1}$	0.0014	0.0027		
	(0.002)	(0.002)		
Change in Consultant$_t$ x Abnormal Pay$_{t-1}$		-0.0055		
		(0.003)		
Positive Abnormal Pay$_{t-1}$			-0.0003	
			(0.001)	
Change in Consultant$_t$ x Positive Abnormal Pay$_{t-1}$			0.0092**	
			(0.005)	
Negative Abnormal Pay$_{t-1}$			-0.0057	
			(0.005)	
Change in Consultant$_t$ x Negative Abnormal Pay$_{t-1}$			-0.0042	
			(0.008)	
Large Positive Abnormal Pay$_{t-1}$				-0.0026
				(0.022)
Change in Consultant$_t$ x Large Positive Abnormal Pay$_{t-1}$				0.0068*
				(0.004)
Large Negative Abnormal Pay$_{t-1}$				-0.0092
				(0.019)
Change in Consultant$_t$ x Large Negative Abnormal Pay$_{t-1}$				-0.0020
				(0.004)
Additional Controls	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	6,230	6,230	6,230	6,230
Adjusted R-squared	0.0296	0.0299	0.0302	0.0304

TABLE 7
Impact on the Compensation Peer Groups

Table 7 presents Probit regression models that examine how a peer group changes when there has been a pay advisor change. The models are run on the subsample of firms (1,296 observations) listed in the S&P 500 or S&P 400 indices that changed a pay advisor in the previous year over the 2007-2014 period. The dependent variable in columns 1, 2, and 3 is an indicator of whether the average CEO's salary plus bonus of the firm's new compensation peer group is larger than the prior fiscal year's peer group. The dependent variable in columns 4, 5, and 6 is an indicator of whether the average CEO's total compensation of the firm's new compensation peer group is larger than the prior fiscal year's peer group. Columns 1 and 4 use abnormal pay as the main pay variable and columns 2 and 5 use the separation of abnormal pay into positive and negative values. Columns 3 and 6 use the large positive and large negative abnormal pay indicators. All specifications include the changes of the control variables listed in Table 4, Panel A (where appropriate), but are suppressed for brevity. Variables indexed time "t" are computed as of the current fiscal year, while "t-1" are lagged one period. Pay variables are in millions. All regressions include year and industry fixed effects using the Fama-French 48 classification. We report standard errors in parentheses using robust (Rogers, 1993) standard errors clustered by firm. Variables are defined in Appendix A.

	New PG Salary + Bonus Larger$_t$			**New PG Total Comp Larger$_t$**		
	1	2	3	4	5	6
Abnormal Pay$_{t-1}$	-0.0095			-0.0231		
	(0.023)			(0.019)		
Positive Abnormal Pay$_{t-1}$		-0.0382**			-0.0457**	
		(0.018)			(0.023)	
Negative Abnormal Pay$_{t-1}$		0.0622**			0.0334	
		(0.031)			(0.042)	
Large Positive Abnormal Pay$_{t-1}$			-0.0622*			-0.0332*
			(0.035)			(0.019)
Large Negative Abnormal Pay$_{t-1}$			0.0390*			0.0373
			(0.023)			(0.033)
Additional Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,296	1,296	1,296	1,296	1,296	1,296
Adjusted R-squared	0.0413	0.0436	0.0438	0.0128	0.0125	0.0127

TABLE 8
The CEO Pay Response to Compensation Consultant Turnover

Table 8 presents OLS regression results of the change in CEO pay following compensation consultant turnover for the universe of firms listed in the S&P 500 or S&P 400 indices that have ever hired a pay advisor with complete data for the 2007-2014 period. The dependent variable is the *change in total pay* (Change in Total Pay) for the CEO. Variables indexed time "t" are computed as of the current fiscal year, while "t-1" are lagged one period. Pay variables are in millions. All specifications include the controls listed in Table 4, Panel A but are suppressed for brevity and all variables are defined in Appendix A. All regressions include year and industry fixed effects using the Fama-French 48 classification. We report standard errors in parentheses using robust (Rogers, 1993) standard errors clustered by firm.

	Dependent Variable: Change in Total Pay_t		
	1	2	3
Change in $Consultant_t$	-0.0298	0.2578	0.1228
	(0.129)	(0.218)	(0.151)
Abnormal Pay_{t-1}	-0.4450***		
	(0.197)		
Change in $Consultant_t$ x Abnormal Pay_{t-1}	-0.1355***		
	(0.039)		
Positive Abnormal Pay_{t-1}		-0.5510***	
		(0.151)	
Change in $Consultant_t$ x Positive Abnormal Pay_{t-1}		-0.2137***	
		(0.083)	
Negative Abnormal Pay_{t-1}		-0.1947***	
		(0.022)	
Change in $Consultant_t$ x Negative Abnormal Pay_{t-1}		0.0479	
		(0.186)	
Large Positive Abnormal Pay_{t-1}			-3.1635***
			(0.210)
Change in $Consultant_t$ x Large Positive Abnormal Pay_{t-1}			-1.2867***
			(0.454)
Large Negative Abnormal Pay_{t-1}			1.0098***
			(0.116)
Change in $Consultant_t$ x Large Negative Abnormal Pay_{t-1}			-0.0689
			(0.225)
Additional Controls	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes
Observations	6,230	6,230	6,230
Adj. R-squared	0.261	0.276	0.163

TABLE 9
Shareholder Response to Consultant Turnover in Director Elections

In Table 9 we examine the shareholder response in director elections in response to a change in compensation consultant and whether the pre-change level of CEO pay moderates their response. In columns 1-4, we report OLS regression models of the change in the percentage of "for" votes a director receives in the year following a change in the compensation consultant for the firm. *Change in Consultant* is an indicator variable taking the value of one if the firm changed compensation consultants in year t, zero otherwise. All regressions include firm and year fixed effects and we report standard errors in parentheses computed using robust (Rogers, 1993) standard errors clustered by annual meeting. Variables are defined in Appendix A.

	Dependent Variable: Percentage Change in Director Votes (t+1)			
	1	2	3	4
Change in Consultant$_t$	-0.0118**	-0.0136**	-0.0394**	-0.0117**
	(0.006)	(0.006)	(0.020)	(0.006)
Compensation Committee Member$_{t+1}$		-0.0170***		
		(0.007)		
Change in Consultant$_t$ x Compensation Committee Member$_{t+1}$		0.0048**		
		(0.002)		
CEO Overpaid$_t$			-0.0012**	
			(0.001)	
Change in Consultant$_t$ x CEO Overpaid$_t$			0.0529**	
			(0.025)	
Decrease in Abnormal CEO pay$_{t+1}$				0.0114**
				(0.005)
Change in Consultant$_t$ x Decrease in Abnormal CEO pay$_{t+1}$				0.0017**
				(0.001)
Academic Experience$_t$	0.0211***	0.0213***	0.0203***	0.0199***
	(0.009)	(0.009)	(0.009)	(0.008)
Finance Experience$_t$	0.0222***	0.0199***	0.0224***	0.0212***
	(0.008)	(0.008)	(0.008)	(0.008)
Legal or Consulting Experience$_t$	-0.0055	-0.0051	-0.0060	-0.0057
	(0.008)	(0.008)	(0.008)	(0.008)
Political Experience$_t$	0.0208**	0.0203**	0.0225**	0.0201**
	(0.010)	(0.010)	(0.011)	(0.010)
Military Experience$_t$	-0.0064*	-0.0054*	-0.0060*	-0.0061*
	(0.004)	(0.003)	(0.003)	(0.003)
Undergrad Degree$_t$	0.0135***	0.0157***	0.0142***	0.0136***
	(0.005)	(0.006)	(0.005)	(0.005)
Advanced Graduate Degree$_t$	0.0059***	0.0054***	0.0080***	0.0060***
	(0.002)	(0.002)	(0.003)	(0.003)
MBA Degree$_t$	-0.0062***	-0.0054***	-0.0078***	-0.0060***
	(0.002)	(0.002)	(0.004)	(0.002)
Residual ISS Vote 'For' Rec$_t$	-0.4096***	-0.4145***	-0.4098***	-0.4118***
	(0.022)	(0.022)	(0.022)	(0.021)
Log Assets$_t$	-0.0413**	-0.0414**	-0.0303**	-0.0308**
	(0.021)	(0.021)	(0.015)	(0.015)
Return on Assets$_t$	-0.0738	-0.0737	-0.0657	-0.0716
	(0.115)	(0.115)	(0.115)	(0.114)

Classified Board$_t$	0.0138**	0.0135**	0.0132**	0.0100**
	(0.007)	(0.006)	(0.006)	(0.005)
Poison Pill$_t$	0.0335	0.0332	0.0367	0.0242
	(0.038)	(0.038)	(0.038)	(0.039)
Board Size$_t$	0.0002***	0.0002***	0.0007***	0.0020***
	(0.000)	(0.000)	(0.000)	(0.000)
CEO Chairman$_t$	0.0205**	0.0207**	0.0241**	0.0326**
	(0.010)	(0.010)	(0.012)	(0.015)
Abnormal Pay$_t$	0.0018***	0.0018***	0.0016***	0.0009***
	(0.000)	(0.000)	(0.000)	(0.000)
% Board Independent$_t$	0.0012***	0.0012***	0.0012***	0.0008***
	(0.000)	(0.000)	(0.000)	(0.000)
Total Director Ownership$_t$	0.1147**	0.1146**	0.1306**	0.1217**
	(0.052)	(0.052)	(0.059)	(0.059)
Litigation$_t$	0.0567**	0.0568**	0.0524**	0.0423**
	(0.026)	(0.026)	(0.026)	(0.019)
Accounting Restatement$_t$	-0.1435**	-0.1438**	-0.1299**	-0.1274**
	(0.069)	(0.069)	(0.065)	(0.065)
Non-timely SEC Filing$_t$	-0.0620*	-0.0623*	-0.0664*	-0.0929*
	(0.0035)	(0.035)	(0.035)	(0.052)
Unequal Voting Rights$_t$	0.0289*	0.0291*	0.0322*	0.0290*
	(0.016)	(0.016)	(0.017)	(0.016)
Confidential Voting$_t$	-0.0147**	-0.0145**	-0.0145**	-0.0163**
	(0.007)	(0.007)	(0.007)	(0.008)
Majority Vote Requirement$_t$	0.0368**	0.0369**	0.0349**	0.0363**
	(0.017)	(0.017)	(0.017)	(0.017)
Constant	0.2562	0.2596	0.1830	0.2134
	(0.461)	(0.461)	(0.459)	(0.462)
Firm and Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	20,242	20,242	20,242	20,242
Adj. R-squared	0.127	0.127	0.127	0.127

Compensation Consultants: Whom do they serve? Evidence from Consultant Changes

Internet Appendix

December 20, 2024

Appendix

This Appendix accompanies "Compensation Consultants: Whom do they serve? Evidence from Consultant Changes." We examine the compensation consultant retention decision for a sample of S&P 400 and 500 firms. In this Appendix, we detail more descriptive information about the compensation consultant switches and consultant firms. We present robustness to our findings, focusing on alternate model specifications. Furthermore, we provide additional endogeneity specifications for our analyses. Our results are robust to the inclusion of alternative specifications of variables and models.

1.0 Descriptive Statistics

Table A-1 presents details on firms that switch consultants. We classify consultants into several dimensions: high or low market share; multiservice or single service; industry specialist or generalist. We deem that a consultant has a high market share if it has greater than a five percent market share within our sample. Otherwise, we classify the consultant as having low market share. Following Chu et al. (2018), multiservice consultants are larger firms offering a variety of other services. These services tend to be more lucrative than compensation consulting; thus, these consultants have typically been the target of the cross-selling conflict of interest. Lastly, a consultant is an industry specialist if the difference in size between the consultant's largest industry and second largest industry is greater than one standard deviation (of all industries). Overall, most firms in our sample tend to use high market share consultants, single service consultants and generalists.

[Table A-1]

Further, we split our sample into two distinct time periods. The 2007 to 2010 time period represents the start of when firms must disclose compensation consultants and also contains significant other regulations affecting the consultant industry. The second sample is from 2011 to 2014 and has fewer confounding events. The largest shift in consultant characteristics that occurs between the two samples is the use of multiservice consultants or single service consultants. In the 2007 to 2010 sample, 48% of firms use multiservice consultants. Comparatively, in the 2011-2014 period, that percentage decreased to 22%. This drop is largely a function of the large multiservice consultants spinning off their single service consulting firms.

We next examine consultant's characteristics when boards switch consultants. Most firms switch laterally within the same type of consultant: from high market share to high market share (and low market share to low market share) and from multiservice to multiservice and single service to single service consultants. Potential reasons for this include board preferences, firm size and complexity, and industry specialization.[1]

Table A-2, Panel A details the market share of the top-15 compensation consultants. As noted in the literature, several consultants hold considerable market share, even with the 2009 SEC regulations' impact. For example, in 2009, Towers Watson spun off Pay Governance and many of their current clients chose to switch to Pay Governance (Towers Watson shrunk from 24.5% in 2009 to 10.7% in 2011 and Pay Governance grew to 9.0% in 2011). As of 2014, Frederic W. Cook had the greatest market share at 22.5%. Frederic W. Cook was the largest "specialist" consultant (meaning they offered no cross-selling services) leading up to the 2009 SEC rule, and as the multi-

[1] While consultant tenure would also be interesting to examine, we are precluded from calculating consultant tenure because firms only began consistently reporting consultant names in 2006.

service consultants spun off portions of their businesses, Frederic W. Cook enjoyed a lasting increase in market share from 16.9% in 2009 to 18.9% in 2010.

[Table A-2]

Table A-2, Panel B describes each consultant's industry concentration. Some pay advisors appear to specialize in a particular industry. According to our measure, the following practices are classified as industry specialists: Frederic W. Cook, Mercer, Pearl Meyer, Compensia, Hay Group, Steven Hall & Partners, and FPL Advisors. For example, 67% of Compensia's clients are in the business equipment industry while FPL Advisors exclusively consults for Real Estate Investment Trusts (REITs). Towers Watson (Willis) is an example of a "generalist," having clients across a broad spectrum of industries. Panel C of Table A-2 examines the scope of the top-15 consultants. There is considerable variation in consultant size. Towers Watson (Willis) is the largest multiservice consultancy with 112 U.S. offices and a large international presence. Many single service consultants have one to three US offices and operate domestically.

2.0 Alternative Propensity Score Match (PSM) Specifications

We conduct a propensity score matched firm (PSM) analysis to assess the consultant dismissal rates across firms with highly paid and underpaid CEOs, while controlling for the observable systematic differences among these two subgroups. This section discusses the alternative specifications that we use to determine the appropriate match firms that are used to formulate the appropriate benchmark dismissal rate.

We use four different specifications for assigning matching firms in this section as denoted in Table A-3. Firms are matched in the sample using the same control variables as outlined in Table 4, Panel A. In all four match scenarios, we require the treatment and control firms to be on common support which means that any propensity score above the maximum or below the minimum of the

controls is removed. For the first match, we use a nearest-neighbor approach with a small caliper width of 0.001 between the scores for the control and treated firms allowing for a better, more consistent match. In addition, we match without replacement in the first method such that no control firm is used more than once as a match to a treated firm. In the second specification, we use an extremely small caliper width of 0.0001 to refine the matching between the treated and control firms. In the third specification, we use the three closest neighbors (matches) for the treatment firm and in the last specification, we use the five closest neighbors to match the control and treatment firms. Both the third and fourth specifications still utilize a caliper width of 0.0001 to ensure a minimal distance between observations.

Once the match is complete, we compare the likelihood of consultant group turnover for firms with positive (negative) abnormal CEO compensation to the PSM generated benchmark dismissal rate. For abnormal positive pay, in all four match variations, the difference between the treated and the control groups is positive and statically significant with p-values ranging from 0.01 to 0.06. Firms with arguably overpaid CEOs are two to four percent more likely to switch compensation consultants in the following year than their characteristically matched peers. Interestingly, we also find in some specifications (negative abnormal pay firms), CEOs who are underpaid are three to four percent less likely to dismiss their consultants. These effect sizes are between 8% and 22% of their matched counterparts' unconditional probability of turnover and broadly consistent with the economic effects reported in Table 4, Panel A.

[Table A-3]

3.0 Endogenous Changes in Compensation Consultants and CEO Compensation

In our paper, we argue that inappropriate pay recommendations can lead to consultant turnover. We demonstrate in the paper that boards dismiss their pay advisor when the CEO is

overpaid, and the new compensation consultants tend to correct the problem. Our data explores the channel through which our results manifest and, thus, provide an economic foundation to alleviate concerns they are spurious. However, consultant changes are not randomly assigned, and dismissals could be influenced by other unobservable reasons. It remains possible that consultant dismissals induce policy changes that are not apparent or completely unobservable to the researcher. If this is the case, the change in CEO compensation following consultant turnover is subject to a potential self-selection bias that jeopardizes our conclusions about the impact of dismissals on future CEO compensation.

We attempt to address this additional endogeneity concern using a two-stage Heckman treatment effects model (Li and Prabhala, 2007). This method requires an IV in the first-stage Probit regression modeling the choice to change consultants that meaningfully influences the board's choice to change consultants. The IV cannot have any relation to the subsequent changes in CEO pay in the second stage regression, except through its influence on the propensity to change advisors.

We leverage industry-by-industry time-series variation in the number of consulting options available in the marketplace as a source of locally exogenous variation. Specifically, we use the number of practices available per industry in *t-1* as our instrument to identify the system.[2] The logic of this instrument is simple. The board is more likely to dismiss a sub-par consultant when they have other replacement options available to them. Conversely, when the number of practices decreases, the boards' choices are limited, and they are less likely to switch (the most obvious extreme being just a single option). It is not clear how the number of advisors would influence the board's pay deliberations or any other firm-specific determinants of pay and, therefore, unlikely to

[2] We define industry using one-digit SIC codes. We count a consultant firm as being available in the industry if they have any clients in that specific industry for a given year. We then sum the number of distinct consultants in a given industry each year to obtain our instrument.

affect the following year's change in CEO pay. If we achieve identification, the loading on the Inverse Mills Ratio and its impact on the coefficients can determine the extent of the self-selection bias and its impact on the key results.

[Table A-4]

In Table A-4, we report the first stage Probit regression with the instrument included. The vector of independent variables is the same as those used in Table 4, Panel A in the paper, but the estimates are omitted to conserve space. Columns 1 and 2 use the abnormal pay variable with and without fixed effects. Columns 3 and 4 use the abnormal pay split between positive and negative values with and without fixed effects. Regardless of the specification, results are consistent. Both the abnormal pay and positive abnormal pay remain positively related to changing consultants. In fact, in all specifications, the magnitude and significance are larger than in Table 4, Panel A without the instrument included. Moreover, the instrument loads positively and is statistically significant at the 1% level in all specifications, indicating the instrument satisfies the relevance condition. The estimates suggest that, as the number of available consulting options increases within the firm's industry, firms are more likely to change consultants. The marginal effects at sample means suggest that increasing the number of consultant options in a given industry by one standard deviation increases the likelihood of changing consultants by 2.2 percentage points to 23%.

[Table A-5]

Table A-5 presents the results of the second stage OLS regression with the Inverse Mills Ratio from the first stage added as a control variable. Columns 1 and 2 present results using the abnormal pay with and without fixed effects. Columns 3 and 4 present results using the abnormal pay split between the positive and negative variables with and without fixed effects. In all

specifications, our primary results retain their sign and significance. Following a change in consultants, CEO pay falls, particularly when they were overpaid in the prior year.

Further, the Inverse Mills Ratio is statistically insignificant in all specifications, implying that self-selection bias is not a major concern in our regressions. When the exclusion condition is not met, the second stage model may suffer from multicollinearity issues because the Inverse Mills Ratio is correlated with second stage variables (Lennox, Francis, and Wang, 2011). High multicollinearity can inflate the standard errors but may also indicate the model is not correctly specified. Inflated coefficient estimates are also a symptom of poor instrumental variables that fail to achieve identification in the first stage (Jiang, 2017). We report the variance inflation factors (VIF) for our potentially endogenous variable (consultant change) and the Inverse Mills Ratio in Table A-4. All VIFs are below the accepted critical value of 10, indicating that multicollinearity is not an issue in our specifications (Greene, 2008). The estimated coefficients of interest are similar in magnitude to those reported in the Table 8 base specification in the paper.

We continue to find that new compensation consultants temper excessive CEO pay in this setting and, thus, our post-dismissal results do not appear to be driven by self-selection bias. The preponderance of the evidence suggests unobserved heterogeneity does not drive pay-related dismissals and the post-dismissal changes in executive compensation but acknowledge a skeptical reader may have an alternative explanation for these collective findings.

3.0 Alternative Pay Measures

Many of the recommendation error measures we use throughout the main paper are based on abnormal pay, bifurcations of abnormal pay, or the absolute value of abnormal pay. To address the concern of abnormal pay being right skewed, we augment the Yermack (2006) model to estimate abnormal log pay by using the natural log of grant-date CEO total pay (TDC1 in

EXECUCOMP) in the first stage instead of the unadjusted amount. This version fits the upper end of the pay distribution better in the first stage model and the estimation used in column 1 of Table A.6. For additional robustness, we use an industry-adjusted CEO pay measure to replace our abnormal CEO pay variable. We take the grant-date CEO total pay and subtract the average of the FF48 industry of all firm-years within the EXECUCOMP database. A value greater than zero reflects a CEO who is paid above the industry average for that year. We also use the absolute value of industry adjusted pay and split the industry adjusted pay into its positive and negative components.

The results reported in Table A-6 are quantitatively and statistically similar to our earlier findings reported in Table 4, Panel A of the primary manuscript. Column 1 shows that our results are not driven by skewness in total compensation. Abnormal log pay is positive and statistically significant, indicating that higher abnormal CEO pay increases the likelihood that the firm changes compensation consultants. The results for industry adjusted pay, its absolute value, and its bifurcations are reported in columns 2 through 4 of Table A-6, respectively. When CEOs receive compensation higher than their industry peers, it leads to a greater likelihood of a compensation consultant change (coefficient of 0.0109). Further, when the CEO is excessively paid and the firm changes consultants, the CEO receives a subsequent reduction in compensation (coefficient of -0.086, p-value = 0.00, untabulated).

[Table A-6]

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TABLE A-1

Usage of Compensation Consultants, 2007-2014

This table presents descriptive statistics by year for firms in our sample that use compensation consultants, as reported in their DEF14-A proxy statements. The sample consists of all firms in the S&P 500 or S&P 400 that use a compensation consultant at any point in the sample period. The table provides further details regarding how firms switch between compensation consultants. Each variable is defined in Appendix A in the main paper.

Firms that Switch Consultants	All Years		2007-2010		2011-2014	
	# Obs	% Firms	# Obs	% Firms	# Obs	% Firms
Use High Market Share Consultant	3,956	63.50%	1,924	65.00%	2,032	62.14%
Use Low Market Share Consultant	2,274	36.50%	1,036	35.00%	1,238	37.86%
Use Multi-Service Consultant	2,164	34.74%	1,432	48.38%	732	22.39%
Use Single-Service Consultant	4,066	65.26%	1,528	51.62%	2,538	77.61%
Use Industry Specialist	2,445	39.25%	886	29.93%	1,559	47.68%
Use Generalist	3,785	60.75%	2,074	70.07%	1,711	52.32%
	# Obs	% Switchers	# Obs	% Switchers	# Obs	% Switchers
Switch from High to Low Market Share	186	14.35%	117	14.16%	69	14.68%
Switch from Low to High Market Share	172	13.27%	98	11.86%	74	15.74%
Switch High to High Market Share	632	48.77%	454	54.96%	178	37.87%
Switch Low to Low Market Share	306	23.61%	157	19.01%	149	31.70%
Switch Single- to Multi-Service	111	8.56%	82	9.93%	29	6.17%
Switch Multi- to Single-Service	315	24.31%	211	25.54%	104	22.13%
Switch Single- to Single-Service	502	38.73%	210	25.42%	292	62.13%
Switch Multi- to Multi-Service	368	28.40%	323	39.10%	45	9.57%
Switch Generalist to Industry Specialist	254	19.60%	139	16.83%	115	24.47%
Switch Industry Specialist to Generalist	79	6.10%	37	4.48%	42	8.94%
Switch Generalist to Generalist	792	61.11%	579	70.10%	213	45.32%
Switch Industry Specialist to Industry Specialist	171	13.19%	71	8.60%	100	21.28%

TABLE A-2

Top-15 Compensation Consultants

This table presents the top-15 compensation consultants hired by year and industry. Panel A presents the top-15 compensation consultants hired by firms in the sample ranked by market share in our sample. Pay Governance, Meridian, and Compensation Advisory Partners are specialist consultants (meaning they only offer compensation consulting services) spun off by their parent firms Towers Watson, Aon Hewitt, and Mercer, respectively. Towers Watson and Predecessors includes Towers Perrin, Watson Wyatt, and Towers Watson. Aon Hewitt and Predecessors includes Hewitt & Associates. Aon Hewitt, Radford, and McLagan. Panel B presents the industry concentration by consultant firm using the Fama-French 12 industry classification. Consultant firms considered industry specialists (by client sales) are denoted in bold. An industry specialist is a consulting firm whose largest industry share is at least one standard deviation larger than its second largest industry. All remaining consultant firms are considered generalists. Panel C details the number of offices, international presence, and whether the firm is a single-service (provides only compensation advisory services) or multi-service firm following Chu et. al (2018). Each variable is defined in Appendix A in the main paper.

Panel A: Top 15 Consultant Firms	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**All**
Towers Watson and Predecessors	26.5%	25.7%	24.5%	17.6%	10.7%	9.9%	8.6%	8.7%	16.1%
Pay Governance			0.1%	4.0%	9.0%	8.7%	9.3%	9.4%	5.3%
Aon Hewitt and Predecessors	16.6%	13.8%	13.1%	7.8%	5.2%	5.3%	5.9%	4.6%	8.7%
Meridian			0.6%	4.5%	7.7%	8.1%	9.2%	9.8%	5.2%
Frederic W. Cook	12.7%	15.4%	16.9%	18.9%	19.8%	22.6%	21.8%	22.5%	19.1%
Mercer	13.4%	10.0%	9.1%	7.2%	6.5%	5.1%	4.7%	4.2%	7.3%
Compensation Advisory Partners			0.7%	2.1%	2.4%	2.7%	2.9%	3.4%	1.9%
Pearl Meyer	6.0%	5.7%	5.4%	7.2%	7.6%	8.7%	8.7%	9.1%	7.4%
Semler Brossy	1.3%	2.6%	2.7%	3.4%	3.5%	3.9%	4.8%	5.2%	3.5%
Compensia	1.9%	2.2%	3.4%	3.5%	4.0%	3.5%	4.2%	4.7%	3.5%
Exequity	1.1%	1.2%	1.0%	2.5%	3.4%	3.5%	4.2%	3.6%	2.6%
Hay Group	1.3%	1.6%	1.6%	1.9%	1.8%	1.7%	1.5%	1.6%	1.6%
Steven Hall & Partners	0.4%	0.7%	1.0%	1.4%	1.9%	2.0%	1.6%	1.5%	1.3%
FPL Advisors	1.1%	0.7%	0.7%	0.9%	1.3%	1.2%	1.5%	1.4%	1.1%
Deloitte	1.3%	1.5%	1.2%	1.1%	0.8%	0.9%	1.0%	0.9%	1.1%
% of Total	83.6%	81.2%	82.1%	84.1%	85.7%	87.8%	89.6%	90.6%	85.7%

TABLE A-2 continued:

Panel B: Industry Concentration by Consultant Firm

	Non-Durable	Durables	Manu-facturing	Oil, Gas, & Coal	Chemical	Business Equip.	Phone & TV	Utilities	Wholesale, Retail	Health, Med Equip	Finance	Other
Towers Watson and Predecessors	6.75%	0.69%	15.00%	13.21%	1.42%	9.90%	2.10%	7.10%	21.98%	3.11%	13.21%	5.55%
Pay Governance	7.68%	0.19%	6.67%	15.53%	0.53%	6.33%	4.39%	9.35%	23.31%	2.00%	16.66%	7.36%
Aon Hewitt and Predecessors	6.36%	0.98%	18.57%	10.08%	6.36%	5.62%	0.00%	7.13%	7.96%	7.00%	25.00%	4.94%
Meridian	3.98%	2.02%	16.29%	17.57%	1.23%	2.26%	0.50%	10.32%	10.12%	1.03%	20.97%	13.71%
Frederic W. Cook	5.87%	0.75%	7.20%	3.70%	7.04%	12.09%	2.00%	3.61%	12.49%	11.47%	**21.75%**	12.04%
Mercer	9.44%	1.85%	10.52%	1.46%	8.80%	9.60%	0.17%	5.32%	**27.22%**	5.38%	11.94%	8.31%
Compensation Advisory Ptnrs	10.33%	6.13%	18.21%	0.00%	1.96%	19.38%	0.00%	2.48%	11.03%	5.11%	24.47%	0.89%
Pearl Meyer	2.63%	0.29%	12.64%	**27.43%**	0.16%	12.64%	16.97%	2.85%	15.32%	0.72%	3.94%	4.41%
Semler Brossy	1.01%	10.60%	7.22%	6.03%	2.35%	26.64%	0.00%	2.16%	19.80%	0.11%	21.67%	2.41%
Compensia	0.00%	0.78%	6.27%	0.00%	0.00%	**66.86%**	1.04%	0.00%	0.00%	16.81%	0.31%	7.93%
Exequity	10.97%	0.14%	2.93%	31.03%	0.55%	1.47%	0.00%	6.83%	32.56%	0.25%	8.48%	4.78%
Hay Group	18.11%	0.00%	12.54%	0.14%	2.77%	0.48%	10.18%	4.71%	**38.55%**	9.69%	0.53%	2.31%
Steven Hall & Partners	0.98%	0.77%	0.00%	0.00%	3.79%	10.17%	0.00%	1.67%	25.90%	4.46%	13.57%	**38.68%**
FPL Advisors	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**100.00%**	0.00%
Deloitte	0.00%	0.00%	6.99%	10.31%	30.28%	7.77%	0.00%	4.11%	23.99%	0.00%	11.31%	5.23%

* Industry Specialists are **bolded**

Panel C: Scope of Top 15 Largest Consultant Firms

Consultant	Single v. Multi Svc	# U.S. Offices	Intl Presence	Consultant	Single Multi Svc	# U.S. Offices	Intl Presence
Towers Watson (Willis)	Multi	112	Yes	Compensation Adv.	Single	2	No
Aon Hewitt	Multi	105	Yes	Pearl Meyer	Single	8	Yes
Mercer Human Resources	Multi	69	Yes	Semler Brossy	Single	2	No
Exequity	Single	3	No	Compensia	Single	2	No
Hay Group	Multi	11	Yes	Steven Hall & Ptnrs	Single	1	No
FPL Advisors	Single	3	Yes	Meridian	Single	10	Yes
Deloitte	Multi	110	Yes				
Pay Governance	Single	14	Yes				
Frederic W. Cook	Single	7	No				

TABLE A-3

Alternative Propensity Score Match (PSM) Specifications

A logit model using the controls in Table 4, Panel A in the main paper was used to estimate recommendation errors. The coefficients from the logit were used to calculate propensity scores for the firms in the sample based on the treatment group. Four different methods were used to identify the impact of having a positive (negative) recommendation error on the likelihood a consultant was dismissed. In Panel A the treated firms are firms with a positive recommendation error and in Panel B the treated firms are firms with a negative recommendation error. All four specifications require firms to have common support. Specification #1 uses a distance between observations of 0.001 and no replacement. Specification #2-4 use a distance between observations of 0.0001 and then use one, three, and five nearest neighbor approaches, respectively.

Panel A: Positive Abnormal Pay Firms

Match Specification	Dismissal Rate				
	Treatment Group: Pos. Abnormal Pay Firms	Matching Control Group	Difference	t-stat	p-value
Common support, caliper (0.001), no replacement	0.2211	0.1956	0.0256	2.03	(0.04)
Common support, caliper (0.0001), no replacement	0.2420	0.1988	0.0432	2.68	(0.01)
Common support, 3 Nearest Neighbor, caliper (0.0001)	0.2348	0.2035	0.0313	2.02	(0.04)
Common support, 5 Nearest Neighbor, caliper (0.0001)	0.2348	0.2051	0.0297	1.91	(0.06)

Panel B: Negative Abnormal Pay Firms

Match Specification	Dismissal Rate				
	Treatment Group: Neg. Abnormal Pay Firms	Matching Control Group	Difference	t-stat	p-value
Common support, caliper (0.001), no replacement	0.2011	0.2185	-0.0174	-1.37	(0.17)
Common support, caliper (0.0001), no replacement	0.1942	0.2393	-0.0451	-2.80	(0.01)
Common support, 3 Nearest Neighbor, caliper (0.0001)	0.2057	0.2397	-0.0340	-2.13	(0.03)
Common support, 5 Nearest Neighbor, caliper (0.0001)	0.2057	0.2398	-0.0342	-2.14	(0.03)

TABLE A-4

Self-Selection Model for the Decision to Change Compensation Consultants

This table presents the first stage of our Heckman treatment effects model that accounts for the potentially endogenous decision to change compensation consultants. In columns 1-4, we report Probit regression models that estimate the effect of abnormal CEO pay has on the likelihood of compensation consultant turnover for the universe of firms listed in the S&P 500 or S&P 400 indices that have ever hired a pay advisor and have complete data for the 2007-2014 period. The dependent variable in each model is an indicator for whether the firm changed compensation consultants (*change in consultant*) as of the end of the fiscal year. The key independent variable of interest in Columns 1-2 is the level of abnormal CEO pay. In Columns 3-4, we bifurcate abnormal pay into its positive or negative components. We identify the system by using the number of compensation consulting options available per industry using one-digit SIC codes (*# of Consulting Firms Per Industry*) at the beginning of the fiscal year (as defined in the appendix). Variables indexed time "t" are computed as of the current fiscal year, while "t-1" are lagged one period. Pay variables are in millions. All variables are defined in Appendix A in the main paper. Regressions in columns 1 and 3 have no fixed effects due to the time-industry varying nature of the instrument and columns 2 and 4 include firm fixed effects. We report standard errors in parentheses using robust (Rogers, 1993) standard errors clustered by firm.

Dependent Variable: Change in Consultant$_t$				
	(1)	(2)	(3)	(4)
Abnormal Pay$_{t-1}$	0.0080**	0.0152**		
	(0.004)	(0.007)		
Positive Abnormal Pay$_{t-1}$			0.0147***	0.0192**
			(0.005)	(0.008)
Negative Abnormal Pay$_{t-1}$			-0.0079	0.0037
			(0.010)	(0.019)
# of Consulting Firms Per Industry$_{t-1}$	0.0092***	0.0452***	0.0095***	0.0455***
	(0.004)	(0.010)	(0.004)	(0.010)
Additional Controls	Yes	Yes	Yes	Yes
Firm Fixed Effects	No	Yes	No	Yes
Observations	6,230	6,230	6,230	6,230
Pseudo R-squared	0.042	0.128	0.042	0.128

TABLE A-5

The CEO Pay Response to Consultant Turnover, Accounting for Self-Selection

This table presents the second stage of our Heckman treatment effects model for the effect of a change in compensation consultant on subsequent CEO pay, accounting for self-selection. The second stage OLS regression models are estimated on the universe of firms listed in the S&P 500 or S&P 400 indices that have ever hired a pay advisor and have complete data for the 2007-2014 period. The dependent variable is the change in total compensation (*change in total pay*) for the CEO. Each regression model includes the *Inverse Mills Ratio* calculated from the first stage regressions in Table 4 to control for the observable and unobservable firm heterogeneity in the decision to change compensation consultants (Li and Prabhala, 2007). Variables are defined in Appendix A in the main paper. Variables indexed time "t" are computed as of the current fiscal year, while "t-1" are lagged one period. Pay variables are in millions. All specifications include the Additional Controls listed in Table 4, Column 3 but are suppressed for brevity and all variables are defined in the appendix. All regressions include year fixed effects and columns 2 and 4 include industry fixed effects using the Fama-French 48 classification. We report standard errors in parentheses using robust (Rogers, 1993) standard errors clustered by firm and Variance Inflation Factors (VIFs) testing for multicollinearity for our key independent variable of interest and the Inverse Mills Ratio to assess the adequacy of our model's identification (Lennox et al., 2011).

Dependent Variable = Change in Total Pay_t				
	(1)	(2)	(3)	(4)
Change in $Consultant_t$	-0.0800	-0.0958	0.3415**	0.1522
	(0.119)	(0.136)	(0.163)	(0.173)
Abnormal Pay_{t-1}	-0.4442***	-0.4797***		
	(0.027)	(0.032)		
Change in $Consultant_t$ * Abnormal Pay_{t-1}	-0.1322***	-0.1133***		
	(0.041)	(0.043)		
Positive Abnormal Pay_{t-1}			-0.5522***	-0.6204***
			(0.044)	(0.052)
Change in $Consultant_t$ * Positive Abn Pay_{t-1}			-0.2067***	-0.1766***
			(0.040)	(0.060)
Negative Abnormal Pay_{t-1}			-0.1974***	-0.1464***
			(0.058)	(0.049)
Change in $Consultant_t$ * Negative Abn Pay_{t-1}			0.0589	0.0140
			(0.063)	(0.066)
Inverse Mills Ratio	-0.8120	0.2247	-0.9293	0.1908
	(0.653)	(0.174)	(0.648)	(0.171)
Additional Controls	Yes	Yes	Yes	Yes
Year Fixed Effects	No	Yes	No	Yes
Industry Fixed Effects	No	Yes	No	Yes
Observations	6,230	6,230	6,230	6,230
Adjusted R-squared	0.251	0.285	0.267	0.306
Variance Inflation Factors (VIF)				
Consultant Change (t)	1.05	1.22	2.23	2.48
Inverse Mills Ratio	9.33	1.59	9.48	1.60

TABLE A-6

This table presents different regression results that estimate the effect of CEO pay recommendation errors on the likelihood of compensation consultant turnover for the universe of firms listed in the S&P 500 or S&P 400 indices that have ever hired a pay advisor with complete data for the 2007-2014 period. The dependent variable in each column is an indicator of whether the firm changed compensation consultants (*Change in Consultant*) in the fiscal year. The key independent variable of interest in Column 1 is the abnormal log CEO pay, where log CEO pay is the dependent variable in the first stage model. In Column 2, we use industry adjusted pay. In Column 3, the key independent variable is the absolute value of industry adjusted pay and, in Column 4, industry adjusted pay is bifurcated into its positive and negative components. All regressions include the same controls as Table 4, Panel A in the paper. Variables are defined in Appendix A in the main paper. Variables indexed time "t" are computed as of the current fiscal year, while "t-1" are lagged one period. Pay variables are in millions. All regressions include year and industry fixed effects using the Fama-French 48 classification. We report standard errors in parentheses using robust (Rogers, 1993) standard errors clustered by firm.

Dep Var: Change in Consultant$_t$				
	(1)	(2)	(3)	(4)
Abnormal Log Pay$_{t-1}$	0.0414*			
	(0.025)			
Industry Adjusted Pay$_{t-1}$		0.0109***		
		(0.004)		
Absolute Value of Ind. Adj. Pay$_{t-1}$			0.0127***	
			(0.004)	
Positive Ind. Adjusted Pay$_{t-1}$				0.0128***
				(0.004)
Negative Ind. Adjusted Pay$_{t-1}$				-0.0267
				(0.027)
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes
Firm Controls as T4	Yes	Yes	Yes	Yes
CEO Controls as T4	Yes	Yes	Yes	Yes
Observations	6,230	6,230	6,230	6,230
Pseudo R-squared	0.118	0.119	0.119	0.119

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1