

# The Role of Passive Ownership in the Era of Say-on-Pay\*

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# The Role of Passive Ownership in the Era of Say-on-Pay

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## **Abstract**

This paper studies the effects of passive ownership on CEO compensation by exploiting recurring Russell index assignments during the Say-on-Pay era. This setup allows us to draw a causal relationship between passive ownership and parts of CEO compensation that better align incentives when it has become more feasible for shareholders to voice their opinion on executive compensation. We find that an increase in passive ownership leads to greater use of performance-vesting provisions and relative performance evaluation, higher delta, and a shift from cash toward equity awards but does not impact compensation complexity. We also discuss proxy voting, private engagement, and large ownership stake as possible mechanisms. Overall, we find that passive funds play pivotal roles in nudging CEO compensation towards reducing agency conflict through direct and indirect channels.

*JEL* category: G23, G28, G32, J33, M52, M55

*Keywords:* Passive ownership, executive compensation, performance-vesting awards, corporate governance, Say-on-Pay

# 1 Introduction

A dramatic increase in stock market indexing over the last two decades has attracted many studies on its governance impact. Yet, there is no consensus on whether an increased passive ownership through indexing improves or deteriorates corporate governance. On one hand, a line of studies argue that index funds do not actively monitor firms in their portfolio because such actions are costly for them (e.g., Schmidt and Fahlenbrach, 2017; Bennett, Stulz, and Wang, 2020; Heath, Macciocchi, Michaely, and Ringgenberg, 2022). On the other hand, another strand of research argue that passive ownership does perform governance role through either public or private engagement (e.g., Bhidé, 1993; Appel, Gormley, and Keim, 2016; Filali Adib, 2019; Fisch, Hamdani, and Solomon, 2019; Kahan and Rock, 2020; Hsieh, Li, and Tang, 2021).<sup>1</sup>

In this paper, we shed light on the role of passive ownership in shaping an important governance mechanism: *executive compensation*. Surprisingly, the literature lacks evidence on the effect of passive ownership on executive compensation. Some aspects of executive compensations, including total pay, composition, and pay-performance sensitivity, have been examined in a couple of prior studies with no clear evidence of any influence by passive ownership, albeit with one caveat: Earlier studies were conducted for a sample period when there was no clear channel as to how passive funds can actively influence executive compensation. In this study, we address this concern by focusing on a period when shareholders were given a clear path to influence executive compensation: the “Say-on-Pay” era. As a part of the regulatory reforms that was mandated in the Dodd-Frank Act of 2010, Say-on-Pay requires U.S. public firms to submit their executive compensation plan of the “named executives officers” for shareholder approval. Although these votes are advisory in nature, the prior literature<sup>2</sup> finds them to have a positive influence on firm value, and a recent paper, Denis, Jochem, and Rajamani (2020), documents the mechanism of how Say-on-Pay can have a widespread impact on executive compensation.<sup>3</sup> This setting allows us to test whether greater passive ownership leads to better incentive alignment at a time when it is in shareholders’ rights to actively voice their opinion on executive compensation.

The empirical strategy that we use to study how passive institutional ownership affects parts of executive compensation that influence incentive alignment between executives and shareholders is

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<sup>1</sup>Corum, Malenko, and Malenko (2021) try to reconcile these conflicting views by proposing a non-monotonic effect of passive fund growth on governance.

<sup>2</sup>For example, Cai and Walkling (2011) and Ferri and Maber (2013) study the market reaction to Say-on-Pay mandate.

<sup>3</sup>Correa and Lel (2016) and Iliev and Vitanova (2019) explore a shorter-term impact of Say-on-Pay on CEO compensation.

to utilize Russell index assignments. The basic idea is that, while, in general, ownership structure is endogenous to firm characteristics including executive compensation structure, a marginal change in index ownership for firms in a narrow range around Russell 1000/2000 index threshold is exogenous to such characteristics.<sup>4</sup> More specifically, whether a firm is assigned to either index is determined solely based on its market capitalization (market cap), thus is independent of other observable or unobservable characteristics within a narrow bandwidth of market cap around the index threshold. However, once a firm is assigned to either index, its portfolio weight is determined based on market cap ranking *within* each index. Hence, index funds that follow Russell 2000 mechanically hold a large number of shares of top Russell 2000 firms, while those that follow Russell 1000 hold a very small number of shares of bottom Russell 1000 firms. This would eventually lead to a greater index ownership for firms on the top of Russell 2000 than for those on the bottom of Russell 1000 for reasons unrelated to any firm characteristics.

Utilizing this setting of Russell index assignment, we adopt a two-stage least square (2SLS) model with Russell 2000 index membership as an instrumental variable for passive ownership, following a series of papers by Appel, Gormley, and Keim (2016, 2019, 2020). One would be tempted to ideally use a fancier model such as sharp regression discontinuity (RD) estimation to exploit the aforementioned Russell index assignment. Unfortunately, the forcing variable, i.e., the end-of-May total market caps used by Russell, to rank stocks and determine their index assignments are not observable to researchers. Hence, since any unobserved heterogeneity across stocks around the index threshold are correlated with outcome variables of interest, it would be misleading to attribute any spurious differences in the outcome variables between Russell 1000 and 2000 firms to a causal effect of passive ownership. The IV-2SLS estimation while controlling for observed end-of-May market caps (e.g., CRSP market caps) can circumvent this problem and yield unbiased estimates because it does not rely on the continuity assumption for firms around the threshold. It instead requires that exclusion condition be satisfied, which is the case in this IV-2SLS setting because it is plausible that index inclusion would affect outcome variables only through influencing passive ownership as long as the end-of-May market cap is adequately controlled for. By limiting the baseline sample to 200 firms around the index threshold, we additionally control for size in a non-parametric way as well.

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<sup>4</sup>Every year, Russell ranks U.S. public firms based on their end-of-May market capitalization, then assigns 1,000 largest firms to Russell 1000 index and the following 2,000 firms to Russell 2000 index. The reconstituted new indexes begin to be traded on the first Monday of the week in which June 30 falls.

Among many types of executive compensation of interest, we begin our analysis by studying performance-vesting equity awards as they are, by construction, designed to better align managers' interests with shareholders' interests.<sup>5</sup> As a result, it is not surprising to find that performance-vesting equity provisions (stock option or restricted stock awards (RSUs) that vest only upon meeting specific performance criteria based on accounting, stock price, or other metrics) have grown significantly over the past couple of decades as compensation practice among U.S. firms have put greater focus on governance (Gerakos, Ittner, and Larcker, 2007; Bettis, Bizjak, Coles, and Kalpathy, 2010; Li and Wang, 2016; Bettis, Bizjak, Coles, and Kalpathy, 2018). Yet, the question of what exactly is driving this change has been under-explored.<sup>6</sup> In this paper, we propose growth in passive funds and its impact on governance as one of its potential explanations.<sup>7</sup>

However, while it is empirically well documented by Bettis et al. (2010, 2018) that performance-vesting provisions do increase financial incentives for top executives, it is a priori unclear whether increase in passive ownership would lead to more performance-vesting provisions or not. As the classic rent-extraction hypothesis<sup>8</sup> would suggest, when top managers are entrenched and board is not efficient, better (worse) governance by the shareholders would lead to greater use of incentive alignment tools in executive compensation. Therefore, if passive investors exert efforts to ensure CEOs to focus on improving shareholder values and/or making CEO compensation more informative about their effort level, performance-vesting provisions to CEOs will increase with passive ownership. Otherwise, increase in passive ownership is expected to have zero or negative relationship with performance-vesting provisions. Our analysis finds evidence that is consistent with the view that passive investors help improve governance, which, in turn, lead to greater use of performance-vesting provisions: a one standard deviation increase (1.37%) in passive ownership leads to 15.61% increase in the value of performance-vesting awards scaled

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<sup>5</sup>As mentioned in Gerakos, Ittner, and Larcker (2007) and Bettis, Bizjak, Coles, and Kalpathy (2010), a greater use of performance-based vesting conditions on equity awards to executives has been called for by many institutional investors, investment advisors, and proxy advisory firms, as they believe that traditional options and equity awards with time-based vesting conditions are not effectively providing incentives to executives.

<sup>6</sup>Some determinants of the propensity for a firm to include performance-based vesting conditions in its equity compensations to CEO are documented in Gerakos, Ittner, and Larcker (2007) and Bettis, Bizjak, Coles, and Kalpathy (2010), such as new CEO arrival, outside directors, block ownership, past stock return, stock return volatility, and market-to-book ratio. Li and Wang (2016) show the determinants of the use of equity awards with accounting-based vesting conditions such as shareholder horizons, board independence, the signal quality of accounting vs. stock performance, etc.

<sup>7</sup>As a descriptive hint on this, Figure A1 shows a similar trend in growth between passive ownership and performance-vesting awards over the past two decades: while passive ownership has increased from 0.19% to 3.14% (1,553% growth) between 1998 and 2018, the proportion of performance-vesting awards out of total compensation to CEOs has increased from 1.84% to 46.94% (2,451% growth) during the same period.

<sup>8</sup>See Bertrand and Mullainathan (2001), Bebchuk, Fried, and Walker (2002), Bebchuk and Fried (2003, 2004), Edmans and Gabaix (2016), and Edmans, Gabaix, and Jenter (2017) for the rent-extraction view on executive compensation.

by total value of compensation, which accounts for approximately 44.17% of its standard deviation.

This result, however, by itself, is not sufficient of an evidence to conclude that passive investors promote better incentive-alignment or performance-evaluation. For example, the rent-extraction hypothesis suggests that CEOs themselves may adopt more performance-vesting awards, but with low hurdles that are easy to surpass, by exploiting less monitoring by passive investors. In this case, CEO pay would become less sensitive to firm performance. To distinguish these conflicting hypotheses, we look at the performance-sensitivity of CEO wealth (“*delta*”). One challenge in examining the effect of passive ownership on *delta* is that traditional pay-performance-sensitivity (PPS) measure, e.g., Core and Guay (2002), only considers shares or options that are vested and owned by CEO, therefore cannot capture the sensitivity of “expected” CEO wealth to stock price for equity awards with vesting conditions. To overcome this difficulty, we adopt the “*aggregate delta*” introduced by Bettis et al. (2018) that is defined as the change in the *ex ante* expected value of equity awards from perturbing initial stock price by 1% where the expected value is calculated based on Monte Carlo simulations. Consistent with the incentive-promoting role of passive ownership, we find that a one standard deviation increase in ownership by passive funds is associated with a 0.19 standard deviation increase in the *aggregate delta*.

We also examine how passive ownership affects firms’ likelihood of adopting relative performance evaluations (RPEs) in paying their CEOs. RPEs are designed to factor in signals of managers’ effort levels in the compensation contract (“informativeness principle”, Holmström, 1979; Edmans and Gabaix, 2016; Edmans, Gabaix, and Jenter, 2017). Since Holmström (1979, 1982) showed that an optimal contract should include signals that are informative about CEO’s effort, RPEs have been believed to be better at evaluating CEO performance as it rules out factors beyond CEO’s control. Nevertheless, RPEs have not been widely implemented among U.S. firms, and researchers have been studying on this discrepancy between theory and empiric. To the extent that passive funds play a role in improving informativeness of performance measures included in performance-vesting awards, we expect firms with more passive ownership to be more likely to include relative performance goals in their equity awards with performance-based vesting conditions. Consistent with this prediction, our results show that an increase in passive ownership leads to a greater likelihood of using RPE.

Two features of compensation worth more exploration are compensation composition and complexity. First, we examine how passive ownership affects CEO compensation structure by decomposing the

compensation into cash and equity components. CEOs may think of equity compensation that will vest only upon meeting a performance goal as a “two-factor authentication”. Therefore, an increase in performance-vesting provisions may be just a consequence of shifting from conventional equity-based compensations such as stock option to cash awards with performance-based vesting conditions, which would not boost incentives. We find that an increase in ownership by passive funds is followed by a reduction in cash compensation along with an increase in equity compensation. This result strengthens our inference that passive funds do take part in altering CEO compensation toward improved alignment of incentives and signaling of the CEO effort level. We also investigate whether an increase in passive ownership leads to more complex compensation structures. More performance-vesting provisions in response to an increase in passive ownership may simply be a consequence of the management gaming compensation by making performance conditions more complex (but easier to surmount). This, in turn, makes it extremely hard for outsiders to precisely determine the values of performance-vesting awards. By measuring the complexity of performance-vesting equity awards by the number of grants or the number of performance metrics, we find that a greater passive ownership does not lead to more complex performance-vesting equity awards.

We further explore possible mechanisms behind our findings. First, we look into a direct channel through which passive funds can influence executive compensation: proxy voting. Our findings suggest that index funds tend to follow proxy advisors’ recommendations more so when their recommendation is to vote against management proposals. Moreover, we find that an increase in passive ownership raises the likelihood of failed votes on proposed executive compensation as well. These findings indicate that index funds voice their concerns when issues are identified in executive compensation through proxy voting. Second, we look into an indirect channel, private engagement, where institutional investors engage with the management of their portfolio firms behind the scenes to voice their opinions. Our analysis reveals that an increase in passive ownership leads to a higher frequency of compensation-related agenda items being voted on during annual meetings, suggesting that passive investors seek to express their opinions directly to the management, which subsequently leads to updated compensation packages for shareholder approvals. Third, we look into the question of whether passive funds function as an independent governance enhancing party. By focusing on the “Big Three” investment companies (Vanguard, BlackRock, and State Street), which are found to do independent research on portfolio

firms while being mostly passive, we find that our baseline results become even stronger. This indicates that firms with a higher concentration of shares held by the “Big Three” index funds exhibit greater sensitivity to their preferences in terms of executive compensation. Thus, while our findings regarding the direct channel does not allow us to differentiate between passive funds doing independent research that happens to be in line with proxy advisors and blindly following the recommendation of proxy advisors, our third mechanism allows us to argue that passive funds (at least the Big Three funds) play an active role in improving executive compensation.

Finally, we conduct a battery of robustness tests. First, we examine whether our baseline results on all of our main variables of interest hold prior to the enactment of the Dodd-Frank Act, i.e., between 2007 and 2010, as well.<sup>9</sup> Consistent with our findings that only after the Say-on-Pay rule was enacted, the channels through which shareholders (including passive funds) can influence CEO compensations was enriched, we find that our baseline results do not hold during the pre-Dodd-Frank period. Second, we check whether our results on performance-vesting provisions and aggregate delta are robust to a modified estimator in which we look at only firms that switch indexes by adding a firm fixed effect, and find that this is the case.

## 2 Related Literature

Our paper contributes to the growing literature on the effects of passive institutional ownership on corporate governance. Exploiting Russell index assignments, Appel, Gormley, and Keim (2016, 2019) show that a marginal increase in passive ownership leads to improved governance through enabling greater monitoring roles by activists, while Schmidt and Fahlenbrach (2017) and Heath et al. (2022) find the opposite, i.e., higher passive ownership deteriorating governance due to less monitoring by shareholders. Hsieh et al. (2021) argue that the improved governance by passive funds is facilitated through a behind the scene channel rather than through voting. Brav et al. (2020) document that passive funds are indeed active monitors even though they tend to vote in favor of incumbent management. Corum, Malenko, and Malenko (2021) show that the governance role of passive funds depends on their crowding out effects on investors’ wealth allocations between private savings and active funds. In line with the governance-improving role of passive funds, our paper not only provides evidence that higher passive ownership makes executive pay more sensitive to firm fundamentals but also identifies a channel

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<sup>9</sup>Our sample period starts from 2007 when the banding policy was introduced by Russell.



that allows passive funds to play a significant role in impacting firm governance.

Our study also fits in to the line of studies on the relationship between institutional ownership and executive compensation. Smith (1996) and Gillan and Starks (2000) find that institutional investors voice their opinions through shareholder proposals, arguing that executives should be compensated based on firm performance. Hartzell and Starks (2003) first document an empirical regularity that institutional ownership is positively correlated with *delta* while being negatively related to total pay. Almazan, Hartzell, and Starks (2005) find that active investors have greater impact on executive compensation than passive investors due to heterogeneity in monitoring costs between them. Ertimur, Ferri, and Muslu (2011) show that shareholder activism sponsored by union pension funds influences total pay to executives but has limited impact on compensation structures. This paper documents a novel evidence that passive investors also play a significant role in shaping executive compensation, especially during the Say-on-Pay era. This is consistent with findings of Ertimur, Ferri, and Oesch (2013) that proxy advisors have reduced monitoring costs related to executive compensations, which subsequently helps institutional investors with otherwise high monitoring costs to make informed executive compensations voting decisions.

Naturally, our paper also contributes to a line of literature that looks into the effects of policy change on corporate decisions. Cai and Walkling (2011) finds that, in U.S., stock prices of firms with excessive CEO pay reacted positively to the Say-on-Pay rule but it also led to value destruction for others. Ferri and Maber (2013) uses U.K. version of Say-on-Pay rule to show that shareholder votes on executive compensation do have material impact albeit being non-binding in nature. Correa and Lel (2016) uses a large sample from 38 countries with Say-on-Pay rule and finds that CEO pay growth rate declines after the rule and that this slowing is more evident for firms with worse governance. On the other hand, Iliev and Vitanova (2019) finds that CEO total pay actually increases during a short window after the Say-on-Pay rule in U.S. and argues that it did not help curb executive compensation. This paper shows that, only after the Say-on-Pay rule was in effect, higher passive institutional ownership led to changes in executive compensation in the direction of better incentive alignment.

Our study also sheds light on the determinants of performance-based executive compensations. Gerakos et al. (2007) and Bettis et al. (2010) collect data on performance-vesting equity awards and show that new CEO arrival, outside directors, block ownership, past stock return, stock return volatility, and

market-to-book ratio affect the propensity to use such awards. Li and Wang (2016) show that shareholder horizons, board independence, the signal quality of accounting vs. stock performance, and strategic imperatives determine the propensity to use equity awards with accounting-based vesting conditions. Bettis et al. (2018) compute the ex-ante values of performance-based vesting awards and show that these awards increase the delta and vega of executive compensations. This paper contributes to this line of studies by showing that passive ownership also plays a role in promoting the use of performance-vesting provisions to CEO.

### **3 Data and Empirical Methodology**

In this section, we illustrate our data and variables. We also describe our empirical approach to measuring the effects of passive institutional ownership on performance-vesting provisions.

#### **3.1 Data and Sample Construction**

Our baseline sample builds upon data collected from the following databases: ISS Incentive Lab for CEO compensation data; Compustat and CRSP for accounting information and stock prices, respectively. To construct a sample for an identification strategy, we also use data from CRSP Mutual Fund Database (MFDB) for identifying passive institutional investors, Thomson/Refinitiv's S12 data for passive institutional ownership, MFLinks for mapping CRSP MFDB to S12 ownership data, and FTSE/Russell's equity indexes data for Russell index constituents. For tests regarding proxy voting on compensation agenda, we use agenda-item-level data from ISS Voting Analytics' vote results data file which is compiled based on mutual funds' N-PX filings to SEC.

The sample used to identify the effects of passive institutional ownership on performance-vesting provision is created following the identification strategy based on Russell index assignments of Appel, Gormley, and Keim (2016, 2019, 2020). Since we focus on a narrow sample of firms around the Russell 1000/2000 index cutoff, we keep only firms whose Russell's float-adjusted market cap ranking falls within the [900, 1,100] range. After excluding firm-years missing CRSP market cap, we obtain a sample of 2,341 firm-year observations among which there are approximately 180 firms per year on average.

#### **3.2 Variables**

##### **3.2.1 Performance-vesting Provisions**

To measure the degree of performance-vesting provisions in CEO compensation packages and pay-performance-sensitivity of such provisions, we use the ISS Incentive Lab (Incentive Lab) database.

Incentive Lab provides detailed information on incentive awards to executives collected from DEF 14A proxy statements. One of the most important innovations by Incentive Lab is all the details regarding every aspect of plan-based awards including award types, vesting conditions, vesting periods, performance metrics and goals, and payout structures.

To measure the proportion of performance-vesting awards, we consider all plan-based awards granted to CEO in a given year. Each plan-based award is classified into a performance-vesting award if its performance type is “Absolute”, “Relative”, or “Abs/Rel” and into a time-vesting award if the performance type is “Time”. Then we calculate the fraction of performance-based awards as the sum of the values of all performance-vesting awards divided by the total value of all plan-based awards, where each award’s value is proxied by its grant-date fair value reported by the firm. For CEOs not granted any plan-based awards in a given year, the fraction of performance-based awards is coded as zero.

### 3.2.2 *delta* Incentives

One key part of past studies on executive compensation was understanding the incentive consequences of those compensations. As a proxy for the incentives, many papers have used pay-performance-sensitivity or *delta* of equity-based compensation such as stocks and options (e.g., Core and Guay, 2002). It is critical for this study as well to examine these incentives because implication of changes in performance-vesting provisions to CEO would be limited without any incentive consequences.

Many papers in the literature have proxied incentives of executive compensations by *delta*, i.e., changes in the value of the compensation packages to \$1 or 1% increase in the stock price, either using an implicit (e.g., Jensen and Murphy, 1990) or an explicit (e.g., Hall and Liebman, 1998; Murphy, 1999; Core and Guay, 2002) method. However, such methods cannot be applied to estimating the *delta* of a plan-based award, especially a performance-vesting award, because its value is path-dependent, i.e., it depends upon the probability of achieving the performance goal at some point in the future. For this reason, we measure the *delta* following Bettis et al. (2018) (BBCK hereafter), or the *aggregate delta* borrowing BBCK’s term, for performance-vesting awards.<sup>10</sup> The main idea of BBCK in measuring the *aggregate delta* of a performance-vesting award is that one can run a Monte Carlo simulation for each performance goal to estimate the probability of achieving the goal, thereby being able to calculate the *ex-ante* expected present value of the award as well as its hypothetical present value in case of 1% higher

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<sup>10</sup>We would like to thank Swaminathan Kalpathy for generously providing us with details on how this measure is estimated and sharing his insights on this topic with us.

stock price today, and then compute the difference between the two expected values.

We estimate a CEO's *aggregate delta* as follows. First, each performance-vesting award is categorized based on award type and performance metric: a performance-vesting award is either restricted stock unit (RSU), option, or cash award based on award type, and its performance metric is either stock price or an accounting-based measure. Following BBCK, we consider awards with a single stock-price metric and those with one or more accounting metrics. For each performance goal with an accounting metric (stock price metric), we run one million iterations of simulation of the metric from its initial value assuming that the metric follows an arithmetic or a geometric Brownian motion based on a multivariate normal distribution of return on the metric and stock return (univariate normal distribution of stock return). The initial value of the metric is calculated using Compustat data items as of the prior year. We then compute the terminal value of the award for the portion tied to the performance goal at the end of the performance-measurement period: for RSUs, by multiplying the stock price at the end of the period by the number of shares that will vest contingent upon the performance; for options, by multiplying the terminal Black-Scholes option value by the number of units that will vest contingent upon the performance; for cash award, by taking the cash amount that will vest contingent upon the performance. The present value is calculated from this terminal value using the risk-neutral framework. We also estimate another simulated present value by perturbing the metric's initial value by 1% and following the same procedure as just described. The *delta* for each path is computed as the difference between these two simulated present values, and the *delta* for each performance goal is the average of these *deltas* over million different paths. We then take the average of these goal-specific *deltas* across all performance goals in a performance-vesting award, and aggregate the award *deltas* at the firm-year level by taking their average across all performance-vesting awards granted to the CEO in the given year.

Finally, we combine this *delta* for new awards with the *delta* for outstanding awards to form measures at the portfolio level for the CEO. For the sake of tractability, we follow BBCK and consider only new awards for the current year and outstanding awards that were granted over the preceding two years. We do the same for time-vesting awards. For firms without any grant of plan-based awards to their CEO in the current year or in the prior two years that are currently outstanding, the *aggregate delta* is coded to be zero.

### 3.2.3 Passive Institutional Ownership

Our passive institutional ownership data is a subset of the Center for Research in Security Prices (CRSP) Survivorship Bias Free Mutual Fund Database (MFDB). We use the CRSP objective code (`crsp_obj_cd`) to identify funds that invest primarily on equities following Doshi, Elkamhi, and Simutin (2015). We then follow the method used in Appel et al. (2016) to classify funds into passive, active, and others. Specifically, if a fund name includes a string that allows us to identify a fund to be passive or is flagged by CRSP index fund flag as index funds, we classify them as passively managed. Of these index funds, for our main analysis, we focus on index funds that invest primarily on Russell 2000 firms to align our sample with our empirical methodology of Russell index assignment. Lastly, we exclude fund observations with TNA < \$10M to account for survivorship bias. Mutual fund holdings data is from Thomson Financial (also known as CDA/Spectrum S12). The main source of Thomson Financial data is periodic filings by mutual funds to the SEC (N-30D form). We use MFLINKS from Wharton Research Data Services (WRDS) to map CRSP MFDB to the Thomson mutual fund holdings database. With this merged data, we compute one of our main variables, *R2000 IndexOwn*, as percentage of shares outstanding held by Russell 2000 index funds for each firm, year, and quarter.

### 3.3 The Dodd-Frank Act of 2010 and Say-on-Pay

The “Say-on-Pay” rule was one of the regulatory reforms that was mandated in The Dodd-Frank Act of 2010. This rule, which took effect on January 21, 2011, requires U.S. public firms to allow their shareholders to make a non-binding vote on executive compensation of the “named executives officers”. The idea behind this rule was to create shareholder oversight on excessive compensation and to tie executive compensation more tightly with firm performance. Although these votes are non-binding and has a historically high approval rate (~90%), firms rarely fail Say-on-Pay votes consecutively and most firms make changes to executive compensation once they fail. For instance, on April 21<sup>st</sup>, 2017, “Advisory vote to ratify named executive officers’ compensation” failed to pass for Wynn Resorts, Limited. The company made series of changes afterwards highlighted by initiation of performance vesting award in CEO compensation in 2018, which led to them passing the vote next time in 2019.

Given our focus on the effects of intersection between passive ownership and Say-on-Pay, for our main analyses, we use a sample period of 2011 to 2020, which is after Say-on-Pay got enacted. However, in our robustness check section, we do show results for pre Say-on-Pay and post 2003 mandatory voting

regulation on equity compensation period. The 2003 SEC regulation that mandated *ex ante* shareholder voting on equity compensation was legislated in hopes of reducing excessive equity compensation that widely occurred in the 1990s. While it did achieve its goal, it also led to decrease in overall equity compensation to executives as it only focused on equity portion of compensation, leading to less incentive alignment between top executives and shareholders. In our main analyses, We find evidence that the Say-on-Pay rule, albeit being non-binding in its nature, achieve re-alignment of incentives between the two parties. Unfortunately, given our use of IV-2SLS approach, it is not possible to draw statistical conclusion on the difference of results between the two sample periods. However, we believe these results on performance related measures of compensation and *delta* before and after Say-on-Pay at least provide descriptive evidence on the effect of this rule.

### 3.4 Effect of Passive Ownership on Performance-Vesting Provisions

Establishing a causal relationship between institutional ownership and performance-vesting provisions to CEO is challenging. Stock selections by institutional investors are potentially endogenous to the incentive structures of CEO compensations. There may also be other omitted variables that simultaneously affect both institutional ownership and performance-vesting provisions to CEOs.

While there is hardly an ideal way to address this endogeneity issue with institutional ownership, we circumvent the difficulty by exploiting Russell index assignments to identify causal impacts of *passive institutional ownership* (proxied by *R2000 IndexOwn* defined in section 3.2.3) on performance-vesting (PV) provisions to CEO. Every year, Russell ranks stocks in the Russell 3000E index<sup>11</sup> based on their end-of-May total market cap and assign the largest 1,000 firms to the Russell 1000 index and sort the next largest 2,000 firms into the Russell 2000 index. Ideally, one could identify the effects of inclusion in the Russell 2000 by comparing PV provisions or other outcome variables of firms across the two Russell indexes while controlling for total market cap. Unfortunately, a firm's total market cap used to determine Russell index assignments is not observable to researchers, so one cannot attribute any observed differences across the indexes merely to index inclusion. The introduction of a banding policy by Russell in 2007 further complicates this difficulty in using Russell index assignment as an identification strategy: a firm's market cap is now required to shrink (grow) by more than 2.5% of the Russell 3000E index cumulative market cap below (above) the Russell 1000/2000 cutoff to switch indexes. To mitigate

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<sup>11</sup>Russell 3000E contains the largest 4,000 U.S. firms.

these concerns, we follow Appel, Gormley, and Keim (2019), and employ their IV estimation methodology. Specifically, we estimate the following two-stage least square (2SLS) model while using inclusion in the Russell 2000 index as an instrumental variable (IV) for *IndexOwn*, i.e., the first stage

$$\begin{aligned}
 R2000\ IndexOwn_{i,t} = & \phi_0 + \phi_1 R2000_{i,t} + \sum_{n=1}^N \phi_{2,n} Ln(Mktcap_{i,t})^n + \phi_3 Ln(Float_{i,t}) \\
 & + \phi_4 Band_{i,t} + \phi_5 R2000_{i,t-1} + \phi_6 Band_{i,t} \times R2000_{i,t-1} + \tau_t + \varepsilon_{i,t},
 \end{aligned} \tag{1}$$

and the second stage

$$\begin{aligned}
 PV_{i,t} = & \beta_0 + \beta_1 R2000\ \widehat{IndexOwn}_{i,t} + \sum_{n=1}^N \beta_{2,n} Ln(Mktcap_{i,t})^n + \beta_3 Ln(Float_{i,t}) \\
 & + \beta_4 Band_{i,t} + \beta_5 R2000_{i,t-1} + \beta_6 Band_{i,t} \times R2000_{i,t-1} + \tau_t + \varepsilon_{i,t}
 \end{aligned} \tag{2}$$

where  $i$  indexes firms and  $t$  indexes years. *Mktcap* is the end-of-May CRSP market cap and *Float* is Russell’s float-adjusted market cap. The indicator variable *Band* denotes a firm being “banded” by Russell in reconstitution year  $t$ , thereby not switching indexes as its market cap distance from Russell 1000/2000 threshold is smaller than 2.5% of the total market cap of the Russell 3000E index.  $\tau_t$  denotes year fixed effects. We cluster standard errors at the firm level. The main coefficient of interest here is  $\beta_1$ , which captures the marginal change in the fraction of performance-based awards in response to a 1% increase in ownership by index funds following the Russell 2000 index.<sup>12</sup>

The causal interpretation of this IV estimation relies on the exclusion condition that, once the determinants of index assignment, i.e., end-of-May market cap and whether the firm is “banded” by Russell, are properly controlled, index assignment affects performance-vesting provisions to the CEO only through its impact on Russell 2000 index institutional ownership. As argued in Appel, Gormley, and Keim (2016, 2019, 2020), this exclusion condition is satisfied because it is unclear why index assignment should affect CEO compensation after robustly controlling for end-of-May market cap (proxied by end-of-May CRSP market cap and Russell’s float-adjusted market cap) and the indicator variable *Band*. To further control for size in a non-parametric way and sharpen our analysis, we follow the literature

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<sup>12</sup> $\phi_1$  is also a coefficient of interest as the second stage estimation would not mean much if the estimated  $\phi_1$  shows a weak instrumental variable problem.

and restrict our sample to a bandwidth of 100 firms around the Russell 1000/2000 cutoff, i.e., firms whose CRSP end-of-May market cap ranking falls between 901 and 1,100.<sup>13</sup>

## 4 Results

This section presents our results on the causal effects of passive institutional ownership on CEO compensation packages using an identification strategy based on Russell index assignments.

### 4.1 Sample Statistics

To examine how a marginal increase in a firm’s shares passively owned by institutional investors affects the firm’s incentive packages to its CEO, we use the sample of firms in a narrow bandwidth around the Russell 1000/2000 index cutoff, as described in Section 3.1.

In Table 1, we report descriptive statistics of the sample used in the tests throughout this section. First, we find consistent summary statistics for our institutional ownership variables when compared to that of the earlier studies. Moreover, although not tabulated, one thing that stands out when we look at time-series development of these variables is that, we again find the pattern of passive ownership increasing over time. This increase in passive ownership in the recent period makes it important to understand the role that passive ownership play in corporate governance more so than in the past. Second, as recent literature on executive compensation documents, percentage of equity compensation has increased substantially over the years to 51.38% and fraction of performance-vesting awards to 31.9%. One thing to note, albeit its increase, is that performance-related CEO compensation variables that we use in this section are highly skewed. For example, the fraction of performance vesting awards has a median value of 24.23% while the 75<sup>th</sup> percentile value is 57.14%. Similarly, pay-performance sensitivity measure of Bettis et al. (2018) has a median value of 0.22% and the 75<sup>th</sup> percentile value is 0.61%.

TABLE 1 ABOUT HERE

### 4.2 First-Stage Estimation

In this subsection, we report the estimation results of Equation (1) in Section 3.4, i.e., the first-stage regression of our IV estimation where we regress Russell 2000 index fund ownership in a given firm

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<sup>13</sup>To address the concern as to how Russell ranks firms within each index, as described well by Appel, Gormley, and Keim (2020), we also use a wider bandwidth of 250 firms around the cutoff as a robustness check and find that the results remain unchanged.



on a dummy variable for whether the firm is in the Russell 2000 index or not. We also include three different polynomial orders of log market capitalization (one to three), a control variable for float, control variables for the “banding” policy of Russell 2000, and time fixed effect in order to robustly control for factors that influence index inclusion. The result of this analysis is reported in Table 2. Consistent with earlier studies, we find that there is a positive relationship between passive institutional ownership in a given firm and whether the firm is included in the Russell 2000 index, statistically significant at the 1% level for all three specifications. We find that, once known relevant variables are controlled for, firms that are included in the index have 2.47% higher ownership by Russell 2000 index funds compared to similar firms that did not make the index. This difference is relevant as the mean ownership by Russell 2000 index funds is 1.26% during the sample period. With this first stage result of our two-stage least square (2SLS) model described in section 3.4 established, we then show in the next subsections series of results that show second stage results using different aspects of CEO compensation.

TABLE 2 ABOUT HERE

### 4.3 How Passive Funds Affect CEO Compensation

#### 4.3.1 Performance-vesting Provisions

In this subsection, we examine the effects of passive ownership on performance-vesting provisions in CEO compensation. If passive funds care about shareholder value or managerial efforts, an increase in passive ownership would lead to more performance-vesting provisions. To document causal evidence on this hypothesis, we estimate Equation (2) in Section 3.4. To investigate both a marginal change in the amount of performance-vesting provisions and the likelihood of adopting a performance-vesting equity award at all in response to an increase in passive ownership, we use the fraction of performance-vesting equity awards and an indicator variable for firms granting any performance-vesting equity awards in a given year, respectively, as our dependent variables.

The estimation results of the second-stage regressions reported in Table 3 show strong positive relationships between passive ownership (instrumented by Russell 2000 index membership) and both the fraction and the likelihood of performance-vesting provisions during the post-Say-on-Pay (*post-SoP*) period. Not only are the relationship statistically significant for all specifications at least at 1% level,

but their economic significance is also big. For example, one standard deviation increase in ownership by Russell 2000 index funds (1.37% increase based on Table 1) leads to 15.61% increase in fraction of performance-based awards when three polynomial orders of market capitalization is used (specification (3)). Although this is equivalent to roughly 44.17% of one standard deviation of the measure during the same period, the fraction of performance-based awards is a highly skewed measure with median having a value of 24.23% and 75<sup>th</sup> percentile having a value of 57.14%. Thus, 15.61% increase should be interpreted as moving a company in the 50<sup>th</sup> percentile to 65<sup>th</sup> percentile during the sample period, which is a sizeable increase. Similar inference that an increase in passive ownership leads to an increase in performance-vesting provisions can be drawn for the other dependent variable as well. The results from Table 3 allow us to infer a causal relationship between increase (decrease) in passive ownership and increase (decrease) in performance-related measures of CEO compensation. With these results, we show that increased governance through holdings of institutional investors had real impact on CEO-shareholder incentive alignment, when a rule that allows ownership in firms to have a voice on CEO compensation was in effect.

TABLE 3 ABOUT HERE

### 4.3.2 Pay-Performance Sensitivity

With positive relationship between passive ownership and how much of a CEO compensation is linked to performance documented in the previous subsection, we now turn to pay-performance sensitivity of CEO compensation to evaluate any incentive consequence. These measures, *deltas*, will allow us to test whether the magnitude at which the compensation of CEOs are tied to *ex ante* expected or *ex post* realized performance of the firm changes with passive ownership.

In Table 4, we use two different measures of pay-performance sensitivity: one that considers probabilistic value of plan-based grants contingent upon the paths of performance metrics (BBCK (2018) *aggregate delta* (%)) and the other that is a more traditional *delta* (*total delta*), which calculates the change of value of the compensation packages to changes in stock price. We then report the results of each in panel A and B accordingly. When using the BBCK (2018) *aggregate delta*, we find that an increase in passive ownership leads to increases in marginal pay-performance sensitivity of CEOs and this relationship is both statistically significant and economically large at the same time (i.e. one

standard deviation increase in ownership by Russell 2000 index funds ( $1.37 * 0.077$ ) leads to 0.19 standard deviation increase in BBCK (2018) *aggregate delta*). Given that the BBCK (2018) *aggregate delta* measures the marginal changes in the ex ante expected value of CEO compensation that also contains performance-vesting equity awards, this result suggests that the increased performance-vesting provisions caused by higher passive ownership also leads to an improvement in managerial incentives.

On the other hand, when we use *total delta* as our dependent variable, we no longer find this result. To be precise, the relationship between passive ownership and *total delta* has negative relationship with no statistical significance. We argue this non-result to be driven by how *total delta* is constructed and shows why *total delta* should be used with caution depending on the research design. As was briefly mentioned in the data section, although *total delta* is useful in capturing the overall impact of changes in value of underlying security to the executive's overall compensation, it does come with shortcomings. First, increase in usage of performance-vesting award makes it important to value these awards with a greater caution as these award values are no longer linear in relation to stock price. Second, increase in usage of accounting metrics and other metrics in performance-vesting awards make the value of these awards to be not directly linked to stock prices. Third, if the focus of the analyses is on whether or not newly granted awards are better incentive aligned, using *total delta* which includes all existing awards might not capture this marginal change in award structure. Thus, we believe that BBCK (2018) *aggregate delta* is a better measure for our purposes and show that in this table how using a misfit delta measure can lead to wrong implication.

TABLE 4 ABOUT HERE

### 4.3.3 Relative Performance Evaluation

An area of compensation that we hope to shed additional light on is relative performance evaluation (RPE). Albeit its strong theoretical background of having the purpose of allowing firms to compensate managers only for things that are under their control but not for shocks that are out of their control, the fact that firms rarely use RPE has been a curious case. Moreover, recent studies on RPE, that came out since the SEC required publicly traded companies to disclose information regarding RPE use in their proxy statements in 2006, has mixed empirical findings on whether or not it helps align the incentive between executives and shareholders. In this subsection, we provide evidence on this topic through the

works of passive institutional investors.

In order to see the effect of passive institutional ownership on relative performance evaluation, we use two dependent variables: indicator variable on use of relative performance evaluation in panel A and number of relative performance evaluation grants in panel B. For both of these dependent variables, we find that increase in passive fund ownership leads to increased use of relative performance evaluation. The economic magnitude of these findings are rather difficult to interpret as 75 percent of observations in our sample has a value of zero for both of these variables. However, this finding shows that once the channel in which passive funds were able to influence firm’s decisions through changes in legislation, these funds were pushing firms to set a compensation structure that has more of a relative performance evaluation component in it. Based on our earlier findings that increase in ownership by passive institutional investors led to changes in compensation structure that led to better alignment of incentives between executives and the shareholders, this table shows us that these passive funds see RPE as a way of reducing agency conflicts and improving incentive alignment.

TABLE 5 ABOUT HERE

#### **4.3.4 Composition (Equity versus Cash)**

We then investigate the impact of passive ownership on the structure of CEO compensation, specifically on its cash and equity components. Equity-based compensation that will vest only upon meeting specific performance criteria may be deemed by CEOs as a form of “two-factor authentication”. If firms switch from equity-based compensation to cash-based compensations as a means to compensate CEOs for having to achieve performance goals, the rise in performance-vesting provisions may not necessarily result in greater managerial incentives.

To test whether and how an increase in passive ownership reshapes compositions of CEO compensation, we decompose the compensation into cash compensation and equity compensation, and estimate Equation (2) in Section 3.4 with each component separately as dependent variables. The estimation results are reported in Table 5. We find drop in cash compensation and statistically significant increase in equity compensation that is also stronger in economic magnitude to be linked to Russell 2000 index ownership during the post-SoP period. During the period, the economic magnitude of one standard deviation increase in passive ownership increases the percentage of equity compensation by 8.92% and

decreases the percentage of cash compensation by 6.48% for specification with three polynomial orders of market capitalization. This increase (decrease) in equity (cash) compensation is almost equivalent to a move from 50<sup>th</sup> (50<sup>th</sup>) percentile to 62<sup>th</sup> (20<sup>th</sup>) percentile, which is significant. Consistent with our earlier findings on performance-vesting equity compensation, we find that higher ownership by index funds leads to lower percentage of compensation being paid in cash and higher fraction of equity-based compensation, leading to better incentive alignment between CEOs and shareholders.

TABLE 6 ABOUT HERE

### 4.3.5 Complexity

In recent years, there has been two notable development in the structure of executive compensation: 1) Non-traditional metrics, such as accounting-based performance metrics and other metrics such as ESG, employee satisfaction, customer satisfaction, and so forth, started being incorporated in executive compensation on top of traditional stock price-based metrics. 2) The magnitude and variety of such non-traditional metrics have dramatically increased. This has led to an increase in the overall complexity of executive compensation packages, which has raised concerns among both practitioners and academia (Hu (2018); Albuquerque, Carter, Guo, and Lynch (2022)). It has been suggested that the increase in complexity is driven by corporate managers' attempts to obfuscate their compensation structures in order to conceal their high pay from outside shareholders.<sup>14</sup> Consequently, it is possible that the increase in performance-vesting provisions due to greater passive ownership may be a result of managers taking advantage of the loose monitoring by passive funds, rather than passive funds improving incentive alignment between shareholders and managers. In this subsection, we aim to test this hypothesis by examining whether an increase in passive ownership, which we have previously shown to have a positive effect on incentive alignment, also leads to a higher degree of complexity in executive compensation.

In Table 7, we use the number of award-grants to CEO in a given year and the average number of performance metrics in each compensation award to capture the complexity of CEO compensation and report the result of each analysis in panel A and B respectively. For both measures of compensation complexity, we do not find any statistically significant relationship between passive institutional ownership and CEO compensation complexity. Moreover, the economic direction of how these measures change

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<sup>14</sup>Albuquerque, Carter, Guo, and Lynch (2022) document mixed evidence on this obfuscation hypothesis.

in relation to changes in passive ownership is inconsistent between the two measures we use: While increases in passive ownership leads to increase in the number of award-grants, it leads to decrease in the number of performance metrics in each award. The findings in this table suggest that passive ownership does not result in an increase in the overall level of complexity in CEO compensation. Therefore, the results in this section reinforces the hypothesis that an increase in passive ownership changes executive compensation in the direction of improving incentive alignment.

TABLE 7 ABOUT HERE

## **5 Discussion of Possible Mechanisms**

The documented results thus far are consistent with passive funds playing an important role in improving incentive features of portfolio firms' executive compensations. However, the specific mechanism through which this improvement occurs remains unclear. In this section, we explore potential mechanisms that could explain our results.

### **5.1 Proxy Voting**

#### **5.1.1 Management Versus Proxy Advisor's Recommendations**

One of the most direct mechanisms through which CEO compensation can be influenced is through proxy voting. Index funds, which hold significant ownership stakes in a firm, may exercise their voting rights to influence executive compensation decisions. However, it is uncertain whether index funds would conduct independent research on individual firms when making voting decisions, given that this effort is costly for them, and most importantly their performance is not dependent on the performance of those firms. Consequently, a possible approach for index funds, if they decide to follow recommendation of someone rather than doing independent research, is to simply align their votes with the management proposal or with the recommendations of proxy advisors. While both of these actions allow passive funds to exercise their voting rights while minimizing costs, which of those two routes these funds take have major implication on whether passive funds add value in monitoring role, as long as proxy advisors are efficient in monitoring.

To test this, we first group all management proposed compensation agendas into two groups: ones that Institutional Shareholder Services (ISS) recommended to vote "for" and the other that ISS

recommended to vote “against”. Then, for each group, we aggregate all votes that voted in line with ISS recommendation on these agenda items at the firm-year level (i.e., number of votes “for” (“against”) when ISS recommended “for” (“against”)). The resulting aggregated number of votes are then divided by the total number of votes for that firm-year. Subsequently, we estimate the IV model, i.e., equations 1 and 2, separately for each group. Our main focus is on the group of agendas where ISS recommended “against”, as these represent cases when management and proxy advisors have different views.

The results are presented in panel A of Table 8. Columns 1–3 report the findings when ISS recommends voting “for”, while columns 4–6 present the results for the “against” recommendation. Interestingly, we observe positive effects of passive ownership on the alignment between votes and ISS recommendations only in the case of the “against” recommendation. No such relationship is observed when the recommendation is “for.”<sup>15</sup> These results suggest that index funds do not vote differently from other shareholders when proxy advisors support executive compensation proposals, which aligns with the “rubberstamping” hypothesis proposed by Malenko, Malenko, and Spatt (2022). However, index funds are more likely than other shareholders to follow proxy advisors’ recommendations against executive compensation proposals. This implies that index funds tend to side with proxy advisors rather than management, when proxy advisor recommends to vote “against”.<sup>16</sup> Thus, as long as proxy advisors are efficient monitors, we find evidence that passive funds add value in monitoring executive compensation of firms through their proxy votes.

### 5.1.2 Voting Outcomes

We also examine whether passive ownership has any causal impact on executive compensation related voting outcomes. The estimation results of equation 2 where the dependent variable is the fraction of compensation proposals that either passed (Columns 1–3) or failed (Columns 4–6) are presented in panel B of Table 8.<sup>17</sup> We find that an increase in passive ownership raises the likelihood of failed

<sup>15</sup>This finding is consistent with what is documented by Ertimur, Ferri, and Oesch (2013) that institutional investors do not blindly follow voting recommendations by proxy advisors for Say-on-Pay, but are more likely to vote in line with proxy advisors when the recommendation is “against” the proposed compensation. That being said, our results additionally suggest that index funds are not excluded from institutional investors showing such voting patterns.

<sup>16</sup>Considering the documented voting patterns by Ertimur, Ferri, and Oesch (2013) and Brav, Jiang, Li, and Pinnington (2022) that institutional blockholders and the Big Three fund families do not blindly follow proxy advisors’ recommendations, this may imply that index funds tend to discreetly vote against compensation proposals when proxy advisors recommend to vote for. However, the voting outcome will be more uncertain in this case because proxy advisors’ recommendation is the key determinant of voting outcomes (Del Guercio, Seery, and Woidtke, 2008; Cai, Garner, and Walkling, 2009; Ertimur, Ferri, and Muslu, 2011).

<sup>17</sup>For most cases where there is only one compensation proposal in a given year during the annual shareholder meeting, the dependent variable takes binary values of either one or zero. However, when multiple shareholder meetings occur within

Say-on-Pay votes regarding proposed executive compensation. However, we do not find any significant results concerning the likelihood of passing compensation proposals. While the results suggest that a marginal increase in passive ownership is likely to result in a higher probability of failed executive compensation proposal, it is worth noting that the strength of these results is limited due to the scarcity of such occasions in our sample.<sup>18</sup>

In order to provide a more intuitive understanding of what we found until now and how proxy voting by index funds could affect executive compensation of their portfolio firms, we present an anecdotal illustration. The Middleby Corporation, which is a part of Russell 2000 index, failed its Say-on-Pay vote on May 14<sup>th</sup>, 2013 with only 48.5% support. One of the largest Russell 2000 index-following funds, the iShares Russell 2000 ETF, was one of many passive funds who voted against the management proposal to pass this agenda, taking the side of ISS recommendation of “Against”. Specifically, the iShares Russell 2000 ETF, who held 889,734 shares of Middleby Corporation on March 31<sup>st</sup>, 2013, had 4.73% of share outstanding of the company. A few months later, on March 27<sup>th</sup>, 2014, the company filed a form DEF-14A with the Securities and Exchange Commission (SEC) and informed its shareholders that “In response to this vote, we have re-examined the Company’s approach to executive compensation. ... we have made substantial changes to our executive compensation policies and practices that reflect the views and advice of many major stockholders ...”. One of the prominent changes that the company made was to implement performance vesting award for the CEO for the first time in 2013 after failing its Say-on-Pay vote.

The findings in section 5.1.1 and section 5.1.2, combined with the existing empirical evidence that the majority of Say-on-Pay proposals receive strong support (Ertimur, Ferri, and Oesch, 2013; Malenko and Shen, 2016), suggest that index funds play a pivotal role through their voting participation in making changes to executive compensation when issues are identified by taking side with proxy advisors.<sup>19</sup> However, it should be emphasized that we cannot distinguish between the hypothesis that

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a year, the dependent variable could be a fractional value ranging from zero to one.

<sup>18</sup>Out of approximately 1,000 failed Say-on-Pay votes across all firms in the N-PX universe during our sample period, only 22 instances fall in our sample of firms within the narrow range surrounding the Russell 1000/2000 cutoff. Among these, 10 cases come from firms within the upper echelon of the Russell 2000.

<sup>19</sup>Malenko and Shen (2016) demonstrate that proxy advisors’ recommendations exert a significant impact on the outcome of Say-on-Pay votes. At first glance, one may interpret the incentive improvement observed in firms with a greater passive fund ownership, as documented in our study, as merely a result of passive adherence to these recommendations, rather than active monitoring. However, Malenko, Malenko, and Spatt (2022) and Krahnert, Boot, Senbet, and Spatt (2022) contend that proxy advisors may have incentives to produce recommendations with a bias towards controversy, rather than the most optimal one. Therefore, it is theoretically unclear whether firms with more incentive-compatible executive compensation



index funds actively conduct independent research, which coincidentally leads to the same conclusion as proxy advisors' recommendations, and the hypothesis that they passively follow proxy advisors' recommendations. Specifically, at this stage, we are agnostic of whether index funds do independent research or not since it is empirically impossible to tie proxy voting outcome to whether shareholders did an independent research or not. We will try to look into the question of whether index funds do independent research in a different setting in section 5.3.

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TABLE 8 ABOUT HERE

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## 5.2 Private Engagement

Theories have suggested shareholders' "voice" as an effective, yet costly governance mechanism (e.g., Shleifer and Vishny, 1986; Admati, Pfleiderer, and Zechner, 1994; Maug, 1998; Kahn and Winton, 1998; Bolton and Von Thadden, 1998; Faure-Grimaud and Gromb, 2004). One channel in which these voices by the shareholders can take form is by proposing agendas to be voted on during the shareholder meetings. However, surprisingly, total number of agendas on executive compensation proposed by shareholders is significantly smaller and almost close to zero compared to those proposed by the management, especially since Say-on-Pay has been enacted in 2011. Does this mean shareholder voice empirically is not a practical governance mechanism? A recent survey paper by McCahery, Sautner, and Starks (2016) shows that this does not necessarily have to be the case. In their paper, McCahery et al. (2016) provides evidence that is not only consistent with above mentioned phenomenon but also with above theories in that institutional investors engage with the management of their portfolio firms "behind the scenes" to voice their opinion. Hence, to the extent that passive funds seek to express their opinions to the management of their portfolio firms "behind the scenes", we anticipate a higher frequency of compensation-related agenda items to be voted on during the annual meetings of firms with higher passive ownership.<sup>20</sup>

Our results show that this is indeed the case. In Table 9, we report our analysis of how agendas voted on has changed with changes in passive ownership during the SoP era. In order to test this, we use

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due to a greater index ownership would have received more or less support from passive funds in their Say-on-Pay votes.

<sup>20</sup>Appel, Gormley, and Keim (2019) demonstrate an alternative approach for passive fund intervention in portfolio company management, namely through collaboration with activist shareholders and coordination of shareholder voting on shareholder proposals. In accordance with the methodologies of Gillan and Starks (2000) and Heath, Macciocchi, Michaely, and Ringgenberg (2022), the agenda items were categorized as those proposed by shareholders and those proposed by management. Our analysis revealed the absence of a single shareholder proposal related to compensation in our sample, suggesting that the activism channel is not applicable at least for the subject matter of our research in this paper.

two measures of “voice”, number of compensation agenda voted on and fraction of compensation agenda voted on, as dependent variables in our second stage regression. Given that the focus of our paper is on how compensation structure has changed due to increase in passive ownership, we focus primarily on agendas voted on that is related to executive compensation. We find that, for both of these measures, increase in Russell 2000 index fund ownership leads to positive and significant increase in number of compensation agendas and proportion of those agendas among all agendas. This confirms our earlier conjecture that private engagement by passive investors is one of the channels on how they alleviate the agency conflict between top executives and shareholders.

TABLE 9 ABOUT HERE

### 5.3 The “*Big Three*” Mutual Fund Families

The “Big Three” investment companies, Vanguard, BlackRock, and State Street, have emerged as the leading equity shareholders in publicly traded U.S. firms, thereby establishing themselves as prominent participants in corporate governance (Brav, Jiang, Li, and Pinnington (2022), by employing the measure of search activity through the SEC’s EDGAR system proposed by Iliev, Kalodimos, and Lowry (2021), find evidence that the “Big Three” index fund families perform even more governance research than active fund families). Additionally, the “Big Three” as a group may strategically prioritize taking actions on their portfolio firms if they hold a significant number of shares, as the performance of their active funds could be impacted by these actions (Kahan and Rock, 2020). Our test in this section aims to examine the role of passive funds as an independent monitor of executive compensation through the lens of “Big Three”’s Russell 2000 index funds. This setting will allow us to precisely capture the effects of increased passive ownership by the better monitoring “Big Three” on executive compensation.

The results of this analysis is reported in Table 10. First, in panel A, we report the result of the first stage regression of our IV-2SLS analysis using ownership by Russell 2000 index funds within “Big Three” investment companies. As was the case with all Russell 2000 index funds in Table 2, we find that these “Big Three” Russell 2000 funds own significantly more shares of firms if they are in the Russell 2000 index. We then show in panel B the results of the second stage regression for our main variables of interest until now using “Big Three” Russell 2000 index ownership as our explanatory variable. For all of the main variables of interest, we find same sign, stronger economic magnitude, and slightly stronger

statistical significance than our earlier tables. We even confirm that compensation complexity does not get impacted by “Big Three” Russell 2000 index funds.

TABLE 10 ABOUT HERE

One aspect of these results is that it once again confirms and strengthens our earlier findings that increase in passive institutional holdings during the period when they have means to influence governance leads to better alignment of incentives between shareholders and top executives. Another aspect to consider is that, as discussed earlier, we cannot rule out the possibility that our results are simply driven by index funds passively following proxy advisors’ recommendations instead of actively monitoring and performing more independent governance research. However, our results in Table 10, combined with the literature that shows the “Big Three” index fund families do perform more independent governance research, may suggest that our results are not just driven by index funds passively following proxy advisors’ recommendations. It may instead suggest that their voting decisions, as a result of their independent research, end up being consistent with the recommendations by proxy advisors. The results reported in columns 9 and 10 in panel B of Table 10 confirm that this is the case.

Before concluding the discussion of the “Big Three” mutual fund channel, it is worth mentioning that these results may look inconsistent with the previous studies that find the “Big Three” to deviate in their voting decisions considerably from proxy advisors’ recommendations (Iliev and Vitanova, 2019; Bubb and Catan, 2022). We can think of two possibilities. First, while those results cover the entire sample of agenda items voted on, we focus only on those related to executive compensation. It is therefore possible that the “Big Three” index fund families vote differently on compensation proposals from other types of proposals. Second, our results show that the alignment between index funds’ voting and proxy advisors’ recommendations only holds when the recommendation is “against” the proposed executive compensation, while the previous studies have shown the deviation between index funds’ voting and proxy advisors’ recommendations without distinguishing between “for” and “against” recommendations. Given that overall support level for management proposals is high, it is possible that index funds tend to vote similarly to proxy advisors’ recommendation when voting against the proposals, but are more likely to deviate from the recommendation if it is “for” management proposals.

## 5.4 Entrenchment vs. Optimal Contracting

Thus far, we have implicitly assumed managerial entrenchment and discussed how index funds, along with other stakeholders, could challenge this entrenchment via modifications to executive remuneration. This possibility is well rationalized, for example, in the theories proposed by Zwiebel (1996) and Kuhnen and Zwiebel (2008): managers are allowed to dictate their own contractual agreements, provided they maintain a satisfactory level of shareholder approval, indicating a potential vulnerability of the board in influencing management. These theories propose that a surge in passive ownership could potentially enhance the sensitivity of pay to performance. This could be attributed to a greater monitoring by shareholders, which further restricts the flexibility of managers in crafting their contracts to avoid any substantial displeasure among shareholders.

Yet, our results can also be explained by an optimal contracting hypothesis. The board (the principal) acts in the best interests of the shareholders and selects the contract for the CEO (the agent) with the intention of providing optimal incentives. The optimal contract, which ensures efficient incentive provision, is subject to modification in response to changes in passive ownership, as an increase in passive ownership alters the non-contractual mechanisms of incentive provision, and because contractual and non-contractual channels are likely substitutes. Two specific non-contractual channels can be identified: monitoring and the market for corporate control. If passive investors engage in reduced monitoring activities, an increase in passive ownership leads to a decrease in monitoring by shareholders. To offset this decline, the board takes corrective measures by augmenting the incentive structure through the compensation contract. Alternatively, if an increase in passive ownership affects the ease or difficulty for a potential buyer to acquire the company (for instance, by altering the liquidity of shares, which in turn influences the feasibility of a buyer acquiring a toehold prior to initiating a takeover bid), the board may revise the contract accordingly.

Empirically differentiating these two theories is challenging as researchers can hardly observe non-contractual mechanisms of incentive provisions. That being said, Corum et al. (2021) posit that monitoring is likely to increase (decrease) if passive funds primarily replace retail (active) investors. In our setting, the increase in passive ownership due to the inclusion in Russell 2000 does not accompany a decrease in active ownership. Instead, passive funds replace primarily retail investors, and thus monitoring is likely to increase. This suggests that our results are more consistent with the “entrenchment” model

of executive compensation than the “optimal contracting” one.

## 6 Robustness Checks

In this section, we provide results of our robustness check tests.

### 6.1 Pre Say-on-Pay

The findings in this paper until this point shows that increase in passive institutional ownership leads to better incentive aligned compensation structure during the period when shareholders were given an opportunity to speak up their voices regarding executive compensation. However, until this point, we have not provided any evidence of comparison between before and after Say-on-Pay, for a reason. The reason is of a technical one rather than an economic one as there is no available statistical test that allows us to compare the coefficients of two IV-2SLS models that analyzes different sample. Albeit this major shortcoming, we believe that the results for a period before Say-on-Pay requires attention of its own, at least as a descriptive evidence. Moreover, this pre-SoP period overlaps with a period after mandatory voting on equity compensation has been enacted in 2003, allowing us to see the effect of this mandatory rule and to see how our main variables of interest reacts to changes in institutional ownership when there was no SoP rule. Unfortunately, due to the changes in how Russell assigns firms to Russell 1000 versus 2000 that happened in 2007, which is a crucial part of our model, our analysis can only go back to 2007 for consistency issues.

In Table 11, we use eight of our main variables of interest that we used in our earlier findings as our dependent variable and apply the same analysis for pre Say-on-Pay period (2007-2010). First thing that stands out in this table is that the coefficient on Fraction of performance-based awards and BCK (2018) aggregate delta (in columns 1 and 2) has a negative sign during the pre-SoP period. In other words, albeit with marginal statistical significance at best, increase in passive ownership of firms led to decrease in performance-related measures of CEO compensation before the SoP rule. While not directly comparable as described above, both had positive and statistically significant coefficient during the post-SoP period, as documented in Table 3 and 4. Secondly, the coefficients on two compensation variables, Equity compensation and Cash compensation (in columns 3 and 4), have the opposite sign with that of the post-SoP period. Moreover, the coefficient on Equity compensation is negative and statistically significant during the pre-SoP period. Given that equity compensation is the key to incentive alignment among the two, this shows that increase in passive ownership also failed to align incentives

through compensation structure during the pre-SoP period. Thirdly, the results on measure of RPE and measure of compensation complexity (in columns 5 and 6) show that an increase in passive ownership did not play a role in nudging the firm toward adoption of more relative performance evaluations nor more complex compensation structure during the pre-SoP period. Finally, we do not find any statistical significance regarding our proposed channel through which passive ownership can have an impact on corporate governance, changes in compensation agenda (in columns 7 and 8), during this period. Overall, the results in this table allows us to show, albeit descriptively, that the changes in institutional ownership did not have any impact on improving governance structure before the SoP rule existed.

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TABLE 11 ABOUT HERE

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## 6.2 Pay Duration

In a perfect and efficient market without stock mispricing, it is unclear whether an increase in passive ownership would result in shorter or longer executive compensation duration, as the duration of projects and executive compensation should not matter for investors. It can be argued that passive funds, being inherently long-term investors, may prefer to award the CEOs with long-term compensation to encourage a focus on valuable long-term projects, but only if these projects and the firm's stock are undervalued (Shleifer and Vishny (1990)). Alternatively, an increase in passive ownership may lead to longer CEO pay duration mechanically due to its positive effect, which is documented earlier in this paper, on the fraction of performance-vesting awards.

Hence, the impact of passive ownership on pay duration is an empirical question. To answer this question, CEO pay duration is calculated following Gopalan, Milbourn, Song, and Thakor (2014), and an IV estimation is run with pay duration as the dependent variable. The results reported in Panel A of Table 12 indicate that an increase in Russell 2000 index fund ownership leads to longer pay duration. However, when pay duration is measured separately for performance-vesting and time-vesting awards, and the IV estimation is run separately for each pay duration measures, it is observed in Panels B and C, respectively, that this positive relationship holds only for performance-vesting awards. This suggests that increase in pay duration is a mechanical consequence of more performance-vesting provisions imposed by passive funds, rather than intentional lengthening of pay duration by passive funds. This mechanical relationship is also driven by how Gopalan et al. (2014) calculate the pay duration for performance-based

vesting awards, where they assume that such awards vest "all at once at the end of the performance measurement period".

TABLE 12 ABOUT HERE

### 6.3 Effects of Index Switching

Finally, our attention is directed towards investigating the impact of index switching. Up to this point, we have exploited cross-sectional variation in passive ownership across firms assigned to the Russell 1000 and the Russell 2000 indexes. While this approach enables us to compare snapshots of outcomes between those firms that have been accumulated for years, it may also be useful to examine the effects of year-to-year changes in passive ownership resulting from index switching. To this end, instead of controlling for year fixed effects only, which we did until now, adding firm fixed effects allows us to capture within-firm variation, which can then be interpreted as capturing the effects for firms that switch indexes. For these firms, we look at how changes in Russell 2000 index fund ownership leads to changes in fraction of performance-based awards and BBCK (2018) *aggregate delta*. The results reported in Table 13 show that our results in Tables 3 and 4 are robust to additionally controlling for firm fixed effects. While the estimated magnitudes of the effects on performance-vesting provisions (panel A) become smaller compared to those estimates in Table 3, the effects on *aggregate delta* (panel B) become even stronger. Overall, the results in this subsection confirm that our baseline results also hold for firms that switch from Russell 1000 to Russell 2000 and consequently have more passive ownership.

TABLE 13 ABOUT HERE

## 7 Conclusion

Market shares by index funds have grown dramatically over the past couple of decades and researchers have studied its impact on various market and corporate outcomes. Yet, little is known on whether and how index funds influence executive compensation, especially after the Say-on-Pay voting rule became mandatory through the Dodd-Frank Act of 2010.

This paper answers these questions by exploiting the widely-adopted Russell index assignments. By focusing on a narrow range of firms around the Russell 1000/2000 index threshold and instrumenting

passive ownership by whether the firm is included in Russell 2000 or not, we find that passive ownership affects various aspects of CEO compensation. Specifically, an increase in passive ownership is followed by more performance-vesting provisions, increased performance-sensitivity of expected values of equity awards, higher propensity to adopt relative performance evaluation, and shift from cash to equity compensations, while not followed by any change in the complexity of the compensation package. Interestingly, these effects are observed only in the era of Say-on-Pay, which is consistent with index funds influencing executive compensations through voting. In addition to a more direct voting mechanism, we also document an existence of indirect mechanism, private engagement by passive funds. Lastly, we show that index funds in the Big Three fund families play an important role as an independent governor of executive compensation. Broadly, our findings suggest that index funds do improve corporate governance by making executive compensations more aligned with shareholders' wealth and more informative about managers' efforts.

It is worth closing our discussions with some caution. First, our analysis is focused on the cross-section of small-cap stocks. Therefore, one cannot simply extend the findings in this paper to a broader question of whether the recent growth in performance-vesting provisions by largest firms is attributable to the growth in passively managed funds. Second, the structures of executive compensations have been getting extremely complicated in the most recent decade. Hence, the need for future studies are warranted regarding the effects of passive ownership on executive compensation in more sophisticated ways.



## References

- Admati, A. R., P. Pfleiderer, and J. Zechner. 1994. Large shareholder activism, risk sharing, and financial market equilibrium. *Journal of Political Economy* 102:1097–1130.
- Albuquerque, A. M., M. E. Carter, Z. M. Guo, and L. J. Lynch. 2022. Complexity of CEO compensation packages. *Luann J., Complexity of CEO Compensation Packages (March 25, 2022)* .
- Almazan, A., J. C. Hartzell, and L. T. Starks. 2005. Active institutional shareholders and costs of monitoring: Evidence from executive compensation. *Financial management* 34:5–34.
- Appel, I., T. A. Gormley, and D. B. Keim. 2020. Identification using Russell 1000/2000 index assignments: A discussion of methodologies. *Critical Finance Review, Forthcoming* .
- Appel, I. R., T. A. Gormley, and D. B. Keim. 2016. Passive investors, not passive owners. *Journal of Financial Economics* 121:111–141.
- Appel, I. R., T. A. Gormley, and D. B. Keim. 2019. Standing on the shoulders of giants: The effect of passive investors on activism. *The Review of Financial Studies* 32:2720–2774.
- Bebchuk, L. A., J. Fried, and D. Walker. 2002. Managerial power and rent extraction in the design of executive compensation.
- Bebchuk, L. A., and J. M. Fried. 2003. Executive compensation as an agency problem. *Journal of economic perspectives* 17:71–92.
- Bebchuk, L. A., and J. M. Fried. 2004. *Pay without performance: The unfulfilled promise of executive compensation*. Harvard University Press.
- Bennett, B., R. M. Stulz, and Z. Wang. 2020. Does joining the S&P 500 index hurt firms? Tech. rep., National Bureau of Economic Research.
- Bertrand, M., and S. Mullainathan. 2001. Are CEOs rewarded for luck? The ones without principals are. *The Quarterly Journal of Economics* 116:901–932.
- Bettis, C., J. Bizjak, J. Coles, and S. Kalpathy. 2010. Stock and option grants with performance-based vesting provisions. *The Review of Financial Studies* 23:3849–3888.
- Bettis, J. C., J. Bizjak, J. L. Coles, and S. Kalpathy. 2018. Performance-vesting provisions in executive compensation. *Journal of Accounting and Economics* 66:194–221.
- Bhide, A. 1993. The hidden costs of stock market liquidity. *Journal of financial economics* 34:31–51.
- Bolton, P., and E.-L. Von Thadden. 1998. Blocks, liquidity, and corporate control. *The journal of finance* 53:1–25.
- Brav, A., W. Jiang, T. Li, and J. Pinnington. 2020. Picking friends before picking (proxy) fights: How mutual fund voting shapes proxy contests. *Columbia Business School Research Paper* .

- Brav, A., W. Jiang, T. Li, and J. Pinnington. 2022. Shareholder Monitoring Through Voting: New Evidence from Proxy Contests. *Available at SSRN 4316541* .
- Bubb, R., and E. M. Catan. 2022. The party structure of mutual funds. *The Review of Financial Studies* 35:2839–2878.
- Cai, J., J. L. Garner, and R. A. Walkling. 2009. Electing directors. *The Journal of Finance* 64:2389–2421.
- Cai, J., and R. A. Walkling. 2011. Shareholders’ say on pay: Does it create value? *Journal of Financial and Quantitative Analysis* 46:299–339.
- Core, J., and W. Guay. 2002. Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting research* 40:613–630.
- Correa, R., and U. Lel. 2016. Say on pay laws, executive compensation, pay slice, and firm valuation around the world. *Journal of Financial Economics* 122:500–520.
- Corum, A. A., A. Malenko, and N. Malenko. 2021. Corporate governance in the presence of active and passive delegated investment. *European Corporate Governance Institute–Finance Working Paper* 695:2020.
- Del Guercio, D., L. Seery, and T. Woidtke. 2008. Do boards pay attention when institutional investor activists “just vote no”? *Journal of Financial Economics* 90:84–103.
- Denis, D. K., T. Jochem, and A. Rajamani. 2020. Shareholder governance and CEO compensation: The peer effects of say on pay. *The Review of Financial Studies* 33:3130–3173.
- Doshi, H., R. Elkamhi, and M. Simutin. 2015. Managerial activeness and mutual fund performance. *The Review of Asset Pricing Studies* 5:156–184.
- Edmans, A., and X. Gabaix. 2016. Executive compensation: A modern primer. *Journal of Economic literature* 54:1232–87.
- Edmans, A., X. Gabaix, and D. Jenter. 2017. Executive compensation: A survey of theory and evidence. *The handbook of the economics of corporate governance* 1:383–539.
- Ertimur, Y., F. Ferri, and V. Muslu. 2011. Shareholder activism and CEO pay. *The Review of Financial Studies* 24:535–592.
- Ertimur, Y., F. Ferri, and D. Oesch. 2013. Shareholder votes and proxy advisors: Evidence from say on pay. *Journal of Accounting Research* 51:951–996.
- Faure-Grimaud, A., and D. Gromb. 2004. Public trading and private incentives. *Review of financial Studies* 17:985–1014.
- Ferri, F., and D. A. Maber. 2013. Say on pay votes and CEO compensation: Evidence from the UK. *Review of Finance* 17:527–563.

- Filali Adib, F. 2019. Passive aggressive: How index funds vote on corporate governance proposals. Tech. rep., Working paper.
- Fisch, J., A. Hamdani, and S. D. Solomon. 2019. The new titans of Wall Street: A theoretical framework for passive investors. *U. Pa. l. Rev.* 168:17.
- Gerakos, J. J., C. D. Ittner, and D. F. Larcker. 2007. The structure of performance-vested stock option grants. In *Essays in accounting theory in honour of Joel S. Demski*, pp. 227–249. Springer.
- Gillan, S. L., and L. T. Starks. 2000. Corporate governance proposals and shareholder activism: The role of institutional investors. *Journal of financial Economics* 57:275–305.
- Gopalan, R., T. Milbourn, F. Song, and A. V. Thakor. 2014. Duration of executive compensation. *The Journal of Finance* 69:2777–2817.
- Hall, B. J., and J. B. Liebman. 1998. Are CEOs really paid like bureaucrats? *The Quarterly Journal of Economics* 113:653–691.
- Hartzell, J. C., and L. T. Starks. 2003. Institutional investors and executive compensation. *The journal of finance* 58:2351–2374.
- Heath, D., D. Macciocchi, R. Michaely, and M. C. Ringgenberg. 2022. Do index funds monitor? *The Review of Financial Studies* 35:91–131.
- Holmström, B. 1979. Moral hazard and observability. *The Bell journal of economics* pp. 74–91.
- Holmström, B. 1982. Moral hazard in teams. *The Bell journal of economics* pp. 324–340.
- Hshieh, S., J. Li, and Y. Tang. 2021. How do passive funds act as active owners? Evidence from mutual fund voting records. *Journal of Corporate Finance* 66:101692.
- Hu, S. S. 2018. Learning about the Details in CEO Compensation. *Available at SSRN 3069824* .
- Iliev, P., J. Kalodimos, and M. Lowry. 2021. Investors’ attention to corporate governance. *The Review of Financial Studies* 34:5581–5628.
- Iliev, P., and S. Vitanova. 2019. The effect of the say-on-pay vote in the United States. *Management Science* 65:4505–4521.
- Jensen, M. C., and K. J. Murphy. 1990. Performance pay and top-management incentives. *Journal of political economy* 98:225–264.
- Kahan, M., and E. B. Rock. 2020. Index funds and corporate governance: Let shareholders be shareholders. *BUL Rev.* 100:1771.
- Kahn, C., and A. Winton. 1998. Ownership structure, speculation, and shareholder intervention. *The Journal of Finance* 53:99–129.

- Krahnert, J., A. Boot, L. Senbet, and C. Spatt. 2022. The Controversy over Proxy Voting: The Role of Asset Managers and Proxy Advisors .
- Kuhnen, C. M., and J. Zwiebel. 2008. Executive pay, hidden compensation and managerial entrenchment. *Rock Center for Corporate Governance Working Paper* .
- Li, Z., and L. Wang. 2016. Executive compensation incentives contingent on long-term accounting performance. *The Review of Financial Studies* 29:1586–1633.
- Malenko, A., N. Malenko, and C. S. Spatt. 2022. Creating Controversy in Proxy Voting Advice. *NBER Working Paper* .
- Malenko, N., and Y. Shen. 2016. The role of proxy advisory firms: Evidence from a regression-discontinuity design. *The Review of Financial Studies* 29:3394–3427.
- Maug, E. 1998. Large shareholders as monitors: Is there a trade-off between liquidity and control? *The journal of finance* 53:65–98.
- McCahery, J. A., Z. Sautner, and L. T. Starks. 2016. Behind the scenes: The corporate governance preferences of institutional investors. *The Journal of Finance* 71:2905–2932.
- Murphy, K. J. 1999. Executive compensation. *Handbook of labor economics* 3:2485–2563.
- Schmidt, C., and R. Fahlenbrach. 2017. Do exogenous changes in passive institutional ownership affect corporate governance and firm value? *Journal of financial economics* 124:285–306.
- Shleifer, A., and R. W. Vishny. 1986. Large shareholders and corporate control. *Journal of political economy* 94:461–488.
- Shleifer, A., and R. W. Vishny. 1990. Equilibrium short horizons of investors and firms. *The American Economic Review* 80:148–153.
- Smith, M. P. 1996. Shareholder activism by institutional investors: Evidence from CalPERS. *The journal of finance* 51:227–252.
- Zwiebel, J. 1996. Dynamic capital structure under managerial entrenchment. *The American economic review* pp. 1197–1215.

**Table 1: Summary statistics**

This table reports the summary statistics of our main variable of interest and controls for our Instrumental Variable Two Stage Least Squares (IV-2SLS) estimation. All of the variables are described in detail in Table 14.

	Mean	Standard deviation	25th percentile	Median	75th percentile	No. of observations
R2000 IndexOwn (%)	1.26	1.37	0.00	0.00	2.41	1,395
Big3 R2000 IndexOwn (%)	0.05	0.09	0.00	0.00	0.05	1,395
IndexOwn (%)	9.21	5.88	4.60	8.71	12.86	1,395
ActiveOwn (%)	17.31	9.89	9.95	17.33	23.92	1,395
OtherOwn (%)	72.11	15.45	63.19	71.16	82.81	1,395
Fraction of performance-vesting awards (%)	31.90	35.35	0.00	24.23	57.14	837
I (Performance-vesting award granted)	0.52	0.50	0.00	1.00	1.00	837
BBCK (2018) aggregate delta (%)	0.45	0.56	0.05	0.22	0.61	808
I (Use of relative performance evaluation)	0.15	0.36	0.00	0.00	0.00	802
Number of RPE grants	0.18	0.44	0.00	0.00	0.00	802
CashComp (%)	22.65	19.93	11.57	15.95	25.48	826
EquityComp (%)	51.38	26.64	36.38	56.08	72.66	826
Number of grants	3.31	1.71	2.00	3.00	4.00	802
Number of performance metrics	2.74	2.00	1.50	2.00	3.00	759
Number of compensation agenda voted on	0.97	0.50	1.00	1.00	1.00	926
Fraction of compensation agenda voted on	0.12	0.08	0.08	0.10	0.17	926
Pay duration (months)	15.13	15.34	0.44	15.29	21.79	832
Pay duration of performance-vesting awards (months)	7.34	11.16	0.00	1.12	12.32	832
Pay duration of time-vesting awards (months)	7.79	11.13	0.00	6.08	11.61	832
ISS Recommendation : For	0.94	0.08	0.93	0.97	0.99	818
ISS Recommendation : Against	0.29	0.20	0.10	0.28	0.46	100
Passed (%)	0.98	0.13	1.00	1.00	1.00	806
Failed (%)	0.02	0.13	0.00	0.00	0.00	806

**Table 2: Effects of Russell index assignment on passive ownership**

This table reports the result of first stage regression of Russell 2000 index fund ownership of the firm on Russell 2000 index member indicator variable and controls (untabulated for brevity). As controls, we include three different polynomial orders of market capitalization (one to three) as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	R2000 IndexOwn (%)		
	(1)	(2)	(3)
R2000	2.465*** (42.66)	2.466*** (42.55)	2.470*** (42.54)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	1,352	1,352	1,352
$R^2$	0.877	0.877	0.878

**Table 3: Effects of passive ownership on performance-vesting provisions**

This table reports the result of second stage regression of fraction of performance-based awards (Panel A) and indicator variable on whether a company granted a performance-based awards that year (Panel B) on Russell 2000 index fund ownership and controls (untabulated for brevity). As controls, we include three different polynomial orders of market capitalization (one to three) as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Fraction of performance-based awards (%)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	10.940*** (3.46)	10.958*** (3.44)	11.398*** (3.56)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	811	811	811
Panel B: I (Performance-vesting award granted)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	17.342*** (4.59)	17.311*** (4.52)	17.798*** (4.53)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	811	811	811

**Table 4: Effects of passive ownership on pay-performance sensitivity**

This table reports the result of second stage regression of pay-performance sensitivity measure of Bettis, Bizjak, Coles, and Kalpathy (2018) (Panel A) and total pay-performance sensitivity of Core and Guay (2002) (Panel B) on Russell 2000 index fund ownership and controls (untabulated for brevity). As controls, we include three different polynomial orders (one to three) of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: BBCK (2018) <i>aggregate delta</i> (%)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (\%)	0.083** (2.20)	0.082** (2.17)	0.077** (2.01)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	783	783	783

Panel B: Total Pay-Performance-Sensitivity (%)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	-30.957 (-1.28)	-31.167 (-1.28)	-31.779 (-1.28)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	774	774	774



**Table 5: Effects of passive ownership on Relative Performance Evaluation**

This table reports the result of second stage regression of indicator variable on use of Relative Performance Evaluation (Panel A) and number of Relative Performance Evaluation grants (Panel B) on Russell 2000 index fund ownership and controls (untabulated for brevity). As controls, we include three different polynomial orders (one to three) of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: I (Use of Relative Performance Evaluation)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	6.437** (2.33)	6.434** (2.32)	6.988** (2.49)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	780	780	780
Panel B: Number of RPE grants			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	5.828* (1.96)	5.825* (1.96)	6.318** (2.10)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	780	780	780

**Table 6: Effects of passive ownership on compensation composition**

This table reports the result of second stage regression of compensation on Russell 2000 index fund ownership and controls (untabulated for brevity). We use equity compensation % in Panel A and cash compensation % in Panel B. As controls, we include three different polynomial orders (one to three) of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Equity Compensation (%)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	6.350** (2.14)	6.301** (2.12)	6.514** (2.13)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	801	801	801
Panel B: Cash Compensation (%)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	-4.394 (-1.63)	-4.392 (-1.63)	-4.733* (-1.74)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	801	801	801

**Table 7: Effects of passive ownership on compensation complexity**

This table reports the result of second stage regression of CEO compensation complexity on Russell 2000 index fund ownership and controls (untabulated for brevity). We use number of grants in Panel A and number of performance metrics in Panel B to measure compensation complexity. As controls, we include three different polynomial orders (one to three) of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Number of grants			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	17.353 (0.84)	17.347 (0.84)	19.455 (0.93)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	780	780	780
Panel B: Number of performance metrics			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	-5.244 (-0.28)	-5.587 (-0.29)	-7.382 (-0.38)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	739	739	739

**Table 8: Possible Mechanisms : Proxy Voting**

This table reports the result of second stage regression of several proxy voting results on Russell 2000 index fund ownership and controls (untabulated for brevity). We use fraction of votes that follow ISS recommendation as dependent variable in Panel A: Columns (1)-(3) [(4)-(6)] are for cases when ISS recommendation on executive compensation is "For" ["Against"]. We use fraction of compensation agenda items passed (Columns (1)-(3)) / failed (Columns (4)-(6)) as dependent variable in Panel B. As controls, we include three different polynomial orders (one to three) of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Fraction of Votes that follow ISS Recommendation						
Variables	ISS Recommendation : For			ISS Recommendation : Against		
	(1)	(2)	(3)	(4)	(5)	(6)
R2000 IndexOwn (%)	-0.267 (-0.60)	-0.264 (-0.59)	-0.301 (-0.66)	3.560** (2.12)	3.498** (2.05)	3.677** (2.07)
Polynomial order, $N$	1	2	3	1	2	3
Banding controls	Yes	Yes	Yes	Yes	Yes	Yes
Float control	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	897	897	897	100	100	100

Panel B: Compensation Agenda Items' Voting Outcome						
Variables	Passed (%)			Failed (%)		
	(1)	(2)	(3)	(4)	(5)	(6)
R2000 IndexOwn (%)	-0.342 (-0.66)	-0.361 (-0.69)	-0.458 (-0.87)	1.010* (1.70)	1.030* (1.72)	1.026* (1.79)
Polynomial order, $N$	1	2	3	1	2	3
Banding controls	Yes	Yes	Yes	Yes	Yes	Yes
Float control	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	782	782	782	782	782	782

**Table 9: Possible Mechanisms : Private Engagement**

This table reports the result of second stage regression of number and fraction of management-proposed compensation-related agendas on Russell 2000 index fund ownership and controls (untabulated for brevity). We use number of compensation agenda voted that are proposed by management in Panel A and fraction of compensation agenda voted that are proposed by management in Panel B. As controls, we include three different polynomial orders (one to three) of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Number of compensation agenda voted on			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	11.187** (2.48)	11.393** (2.53)	11.592** (2.57)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	897	897	897
Panel B: Fraction of compensation agenda voted on (%)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	1.901** (2.37)	1.929** (2.40)	2.019** (2.47)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	897	897	897

**Table 10: Possible Mechanisms : Effects of Big 3 Passive Ownership**

This table reports the result of IV-2SLS regression using ownership of firms by Russell 2000 index funds within big 3 fund families (Blackrock, Vanguard, and State Street). In Panel A, we report results of the 1st stage regression. In Panel B, we report results of the 2nd stage regression using twelve main variables of interest in our earlier tables. As controls, we include three polynomial orders of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: 1st Stage Regression (Big3 R2000 IndexOwn (%))				
Variables	(1)	(2)	(3)	
R2000	0.088*** (9.69)	0.088*** (9.67)	0.090*** (9.83)	
Polynomial order, $N$	1	2	3	
Banding controls	Yes	Yes	Yes	
Float control	Yes	Yes	Yes	
Year FE	Yes	Yes	Yes	
Observations	1,352	1,352	1,352	
$R^2$	0.717	0.717	0.718	

Panel B: 2nd Stage Regression				
Variables	Fraction of perf.-based awards (%)	BBCK (2018) <i>aggregate delta</i> (%)	Equity Compensation (%)	Cash Compensation (%)
	(1)	(2)	(3)	(4)
Big3 R2000 IndexOwn (%)	348.574*** (3.40)	2.337** (1.97)	203.449** (1.97)	-147.815 (-1.64)
Polynomial order, $N$	3	3	3	3
Banding controls	Yes	Yes	Yes	Yes
Float control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	811	783	801	801

(Continued to next page)

**Table 10: Possible Mechanisms : Effects of Big 3 Passive Ownership (Cont'd)**

Panel B: 2nd Stage Regression (cont'd)				
Variables	I(Use of Relative Performance Evaluation)	Number of grants	Number of compensation agenda voted on	Fraction of compensation agenda voted on (%)
	(5)	(6)	(7)	(8)
Big3 R2000 IndexOwn (%)	207.514** (2.47)	577.786 (0.93)	550.052*** (2.59)	95.796** (2.49)
Polynomial order, $N$	3	3	3	3
Banding controls	Yes	Yes	Yes	Yes
Float control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	780	780	897	897

Panel B: 2nd Stage Regression (cont'd)				
Variables	Fraction of Votes that follow ISS Recommendation		Compensation Agenda Items' Voting Outcome	
	ISS Recommendation : For	ISS Recommendation : Against	Passed (%)	Failed (%)
	(9)	(10)	(11)	(12)
Big3 R2000 IndexOwn (%)	-17.553 (-0.65)	182.116** (2.04)	-21.888 (-0.87)	49.041* (1.78)
Polynomial order, $N$	3	3	3	3
Banding controls	Yes	Yes	Yes	Yes
Float control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	810	100	782	782

**Table 11: Effects of passive ownership during pre-SoP period**

This table reports the result of second stage regression of the following eight outcome variables during the Pre Say-on-Pay period: fraction of performance-based awards, BBCK (2018) *aggregate delta*, proportion of equity compensation, proportion of cash compensation, indicator variable on use of Relative Performance Evaluation, number of grants, number of compensation agenda voted, and fraction of compensation agenda voted on. As controls, we include three polynomial orders of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their *t*-statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

	Fraction of performance-based awards (%)	BBCK (2018) <i>aggregate delta</i> (%)	Equity Compensation (%)	Cash Compensation (%)
Variables	(1)	(2)	(3)	(4)
R2000 IndexOwn (%)	-0.993 (-0.15)	-0.039* (-1.71)	-11.142* (-1.75)	2.065 (0.28)
Polynomial order, <i>N</i>	3	3	3	3
Banding controls	Yes	Yes	Yes	Yes
Float control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	446	439	441	441

	I(Use of Relative Performance Evaluation)	Number of grants	Number of compensation agenda voted on	Fraction of compensation agenda voted on (%)
Variables	(5)	(6)	(7)	(8)
R2000 IndexOwn (%)	0.781 (0.27)	-30.151 (-0.86)	1.126 (0.19)	0.375 (0.53)
Polynomial order, <i>N</i>	3	3	3	3
Banding controls	Yes	Yes	Yes	Yes
Float control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	425	425	542	542



**Table 12: Effects of passive ownership on CEO pay duration**

This table reports the result of second stage regression of pay duration on Russell 2000 index fund ownership and controls (untabulated for brevity). We use Gopalan, Milbourn, Song, and Thakor (2014) CEO pay duration measure using all RSUs and options granted to CEO in Panel A, pay duration of performance-based awards in Panel B, and pay duration of time-based awards in Panel C. As controls, we include three different polynomial orders (one to three) of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Pay duration (months)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	268.679*** (2.78)	266.166*** (2.81)	250.682** (2.39)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	807	807	807
Panel B: Pay duration of performance-vesting awards (months)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	204.195*** (3.57)	203.084*** (3.49)	212.261*** (3.54)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	807	807	807
Panel C: Pay duration of time-vesting awards (months)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	64.494 (0.77)	63.093 (0.77)	38.414 (0.42)
Polynomial order, $N$	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	807	807	807

**Table 13: Effects of Russell index switching**

This table reports the result of second stage regression of fraction of performance-based awards (Panel A) and BBCK (2018) *aggregate delta* (Panel B) on Russell 2000 index fund ownership and controls (untabulated for brevity). In this table, we use firm fixed effects instead of time fixed effects in order to capture within-firm variation. As controls, we include three different polynomial orders (one to three) of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their *t*-statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Fraction of performance-based awards (%)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	5.440** (2.13)	5.381** (2.10)	5.339** (2.09)
Polynomial order, <i>N</i>	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	634	634	634
Panel B: BBCK (2018) <i>aggregate delta</i> (%)			
Variables	(1)	(2)	(3)
R2000 IndexOwn (%)	0.090** (2.15)	0.092** (2.19)	0.087** (2.08)
Polynomial order, <i>N</i>	1	2	3
Banding controls	Yes	Yes	Yes
Float control	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	604	604	604

**Table 14: Variable Definitions**

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<i>Accounting-Based Awards (%)</i>	The percentage of awards with accounting-metric-based vesting conditions out of all plan-based awards granted to CEO in a given year.
<i>ActiveOwn (%)</i>	The percentage of shares outstanding held by actively managed equity mutual funds defined using <i>crsp_obj_cd</i> following Doshi, Elkamhi, and Simutin (2015) with TNA larger than \$10M.
<i>Band</i>	A dummy variable equal to one if the firm is "banded" by Russell and does not switch indexes in reconstitution year $t$ because the distance between its end-of-May market capitalization and the Russell 1000/2000 index cutoff is smaller than 2.5% of the cumulative market capitalization of Russell 3000E index which contains the largest 4,000 U.S. publicly traded companies.
<i>BBCK (2018) aggregate delta (%)</i>	The Bettis, Bizjak, Coles, and Kalpathy (2018) pay-performance sensitivity measure using MCMC simulation
<i>Big3 R2000 IndexOwn (%)</i>	The percentage of shares outstanding held by index funds within big 3 index fund families (Blackrock, Vanguard, and State Street) that invests primarily in Russell 2000 index firms.
<i>CashComp (%)</i>	The fraction of cash compensation, i.e. bonus and salary, out of total compensation granted to CEO in a given year
<i>EquityComp (%)</i>	The fraction of equity compensation, i.e. RSUs and options, out of total compensation granted to CEO in a given year
<i>Failed(%)</i>	The percentage of compensation agenda items that failed in a given year.
<i>Float</i>	Ln (float-adjusted market capitalization by Russell as of the last trading day of June each year)
<i>Fraction of compensation agenda voted on (%)</i>	The fraction of agenda items voted on at all meetings in a given year that contain the terminology "compensation" or "incentive" within their respective descriptions.
<i>Fraction of performance-based awards (%)</i>	The fraction of awards with performance-based vesting conditions in a given year
<i>I(Performance-vesting award granted)</i>	An indicator variable that equals one if the firm granted any awards with performance-based vesting conditions in a given year
<i>I(Use of relative performance evaluation)</i>	An indicator variable that equals one if the firm grants its CEO a compensation package in a given year containing any awards based on relative performance evaluation. An award with performance type being equal to "Relative" is categorized as one based on relative performance evaluation.

<i>IndexOwn (%)</i>	The percentage of shares outstanding held by index funds with the CRSP Index fund flag = 1.
<i>ISS Recommendation : Against</i>	The fraction of votes on compensation agenda cast as “Against” conditional on the ISS recommendation being also “Against”.
<i>ISS Recommendation : For</i>	The fraction of votes on compensation agenda cast as “For” conditional on the ISS recommendation being also “For”.
<i>Market capitalization (in billion dollars)</i>	The fiscal year-end market capitalization.
<i>Number of compensation agenda voted on</i>	The number of agenda items voted on at all meetings in a given year that contain the terminology ”compensation” or ”incentive” within their respective descriptions.
<i>Number of RPE grants</i>	The number of awards based on relative performance evaluation granted to CEO in a given year. An award with performance type being equal to “Relative” is categorized as one based on relative performance evaluation.
<i>Number of grants</i>	The number of all awards granted to CEO in a given year.
<i>Number of performance metrics</i>	The average number of performance metrics per award granted to CEO in a given year.
<i>OtherOwn (%)</i>	The percentage of shares outstanding not held by either the actively managed equity funds or index funds.
<i>Passed(%)</i>	The percentage of compensation agenda items that passed in a given year.
<i>Pay duration (months)</i>	The Gopalan, Milbourn, Song, and Thakor (2014) CEO pay duration which is the value-weighted average vesting periods across all RSUs and options granted to CEO in a given year
<i>Pay duration of performance-based awards (months)</i>	The Gopalan, Milbourn, Song, and Thakor (2014) CEO pay duration which is the value-weighted average vesting periods across all RSUs and options with performance-based vesting conditions granted to CEO in a given year
<i>Pay duration of time-based awards (months)</i>	The Gopalan, Milbourn, Song, and Thakor (2014) CEO pay duration which is the value-weighted average vesting periods across all RSUs and options with time/service-based vesting conditions granted to CEO in a given year
<i>I(Post Say-on-Pay)</i>	An indicator variable for Post Say-on-Pay rule period that equals one for year $\geq$ 2011
<i>R2000</i>	An indicator variable that equals one if the firm belongs to the Russell 2000 index in reconstitution year t
<i>R2000 IndexOwn (%)</i>	The percentage of shares outstanding held by index funds that invests primarily in Russell 2000 index firms.

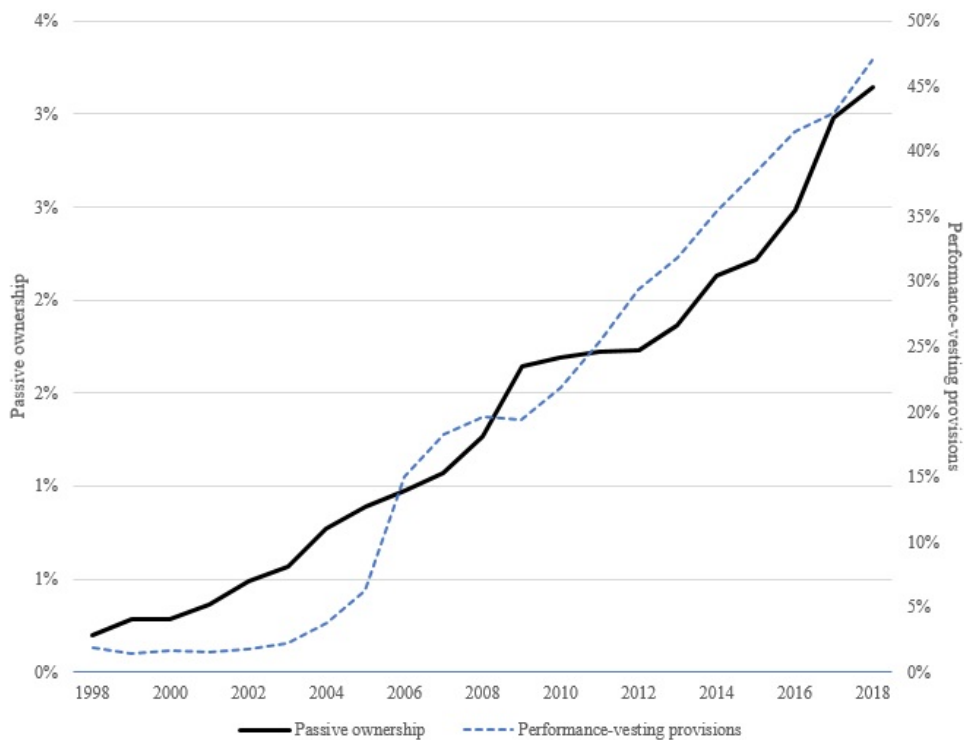
<i>Size (%)</i>	Ln(total assets)
<i>Size1</i>	CRSP market capitalization as of the last trading day of May each year
<i>Size2</i>	size <sup>2</sup>
<i>Size3</i>	size <sup>3</sup>

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# Appendix

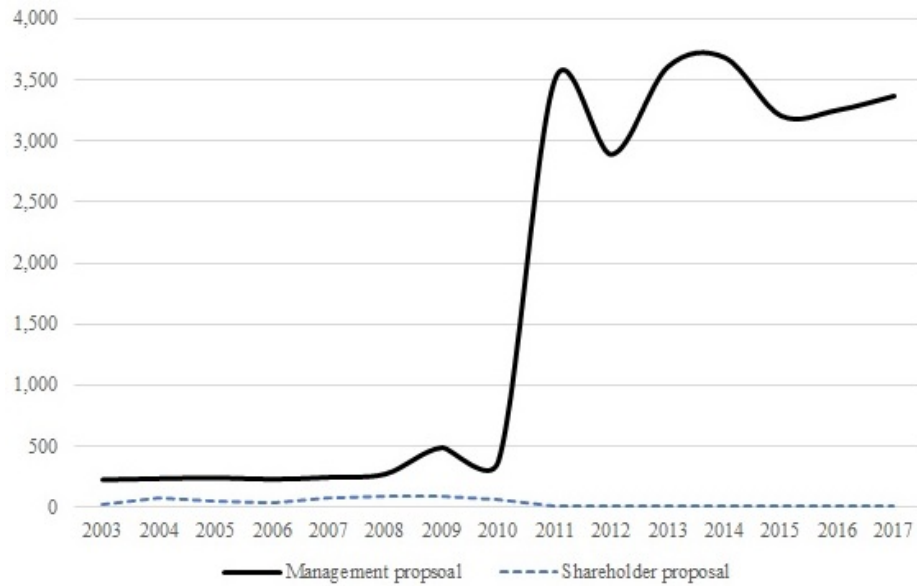
**Figure A1: Time-series trends in passive ownership and performance-vesting provisions**

This figure plots the time-series trend in passive ownership and performance-vesting provisions between 1998 and 2018.

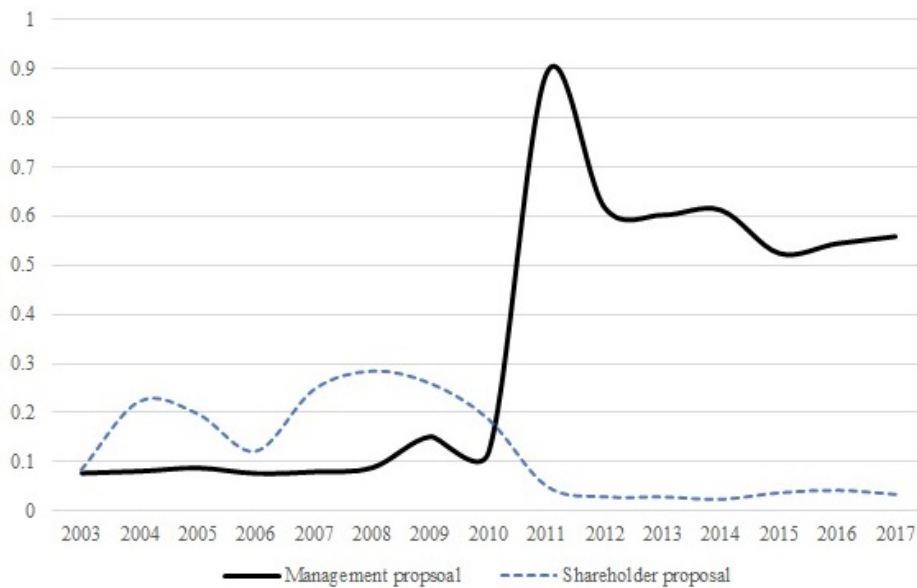


**Figure A2: Time-series trends in number of compensation agendas voted on**

This figure plots the total number of compensation agenda (Panel A) and average number of compensation agendas for each firm-year (Panel B) between 2003 and 2018 for S&P 1500 companies. In each panel, we show both the number of compensation agendas proposed by management (black solid line) and shareholder (blue dotted line) separately.



Panel A: Total number of compensation agenda



Panel B: Average number of compensation agenda

**Table A1: 2nd Stage Regression of IV-2SLS (Index Own)**

This table reports the result of IV-2SLS regression using ownership of firms by all index funds. In Panel A, we report results of the 1st stage regression. In Panel B, we report results of the 2nd stage regression using eight main variables of interest in our earlier tables. As controls, we include three polynomial orders of market capitalization as of the last trading day of May each year, series of banding control indicator variables (Band, previous year Russell 2000 membership, and its interaction), and natural log of float-adjusted market capitalization by Russell as of the last trading day of June each year. All variables are defined in Table 14. In all columns, we report estimated coefficients from OLS regression and their  $t$ -statistics, calculated using heteroskedasticity-robust and firm-clustered standard errors. \*\*\*, \*\*, and \* indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: 1st Stage Regression (IndexOwn (%))				
Variables	(1)	(2)	(3)	
R2000	5.297*** (7.87)	5.292*** (7.84)	5.369*** (7.93)	
Polynomial order, $N$	1	2	3	
Banding controls	Yes	Yes	Yes	
Float control	Yes	Yes	Yes	
Year FE	Yes	Yes	Yes	
Observations	1,352	1,352	1,352	
$R^2$	0.588	0.588	0.589	

Panel B: 2nd Stage Regression				
Variables	Fraction of performance-based awards (%)	BBCK (2018) aggregate delta (%)	Equity Compensation (%)	Cash Compensation (%)
	(1)	(2)	(3)	(4)
IndexOwn (%)	5.331*** (3.37)	0.035* (1.93)	3.090** (2.00)	-2.245* (-1.74)
Polynomial order, $N$	3	3	3	3
Banding controls	Yes	Yes	Yes	Yes
Float control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	811	783	801	801

Panel B: 2nd Stage Regression (cont'd)				
Variables	I(Use of Relative Performance Evaluation)	Number of grants	Number of compensation agenda voted on	Fraction of compensation agenda voted on (%)
	(5)	(6)	(7)	(8)
IndexOwn (%)	3.353** (2.16)	9.337 (0.90)	5.413** (2.28)	0.943** (2.17)
Polynomial order, $N$	3	3	3	3
Banding controls	Yes	Yes	Yes	Yes
Float control	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	780	780	897	897