

Passive Investors, Not Passive Owners^{*}

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Abstract

Passive institutional investors are a growing and increasingly important component of institutional holdings. To examine whether and by which mechanisms passive investors influence firms' governance structure, we use an instrumental variable estimation and exploit variation in passive institutional ownership that is due to assignment of stocks to either the Russell 1000 or 2000 index. We find that an increase in ownership by passive institutions is associated with more independent directors, the removal of poison pills and restrictions on shareholders' ability to call special meetings, and fewer dual class share structures. Passive investors appear to exert influence through their large voting blocs—passive ownership is associated with less support for management proposals and more support for shareholder-initiated governance proposals. While we do not find direct evidence that the increased presence of passive investors facilitates activism by other investors, we do find that ownership by passive investors is associated corporate policies that are likely to mitigate the prospect of an activist campaign, including less cash holdings and higher dividend payouts. In contrast to conventional wisdom, our findings suggest that passive investors play a key role in influencing firms' governance choices.

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“As index investors in a company's stock, we're somewhat like passengers riding in a car we can't exit. In this context, effective governance provisions serve as the seatbelts and airbags that protect our interests should things go awry with the driver (i.e., management and/or the board).”

— Glenn Booraem, controller of the Vanguard funds

I. Introduction

There is much evidence to support the idea that institutional investors influence the governance and corporate policies of firms in which they accumulate ownership stakes (e.g., Aghion, Van Reenen and Zingales (2013); Brav et al. (2008); Hartzell and Starks (2003)). This evidence, however, primarily focuses on the role of “activists” that accumulate shares and make demands upon managers or “active” fund managers that exit positions when managers perform poorly. Yet, such investors represent only a subset of institutional investors. Many institutions are instead “passive” investors that hold diversified portfolios of stocks with low turnover, thereby distinguishing themselves from “active” managers, and do not actively buy or sell shares to influence managerial decisions. The investment objective of such institutions is to deliver the returns of a particular market index (e.g., S&P 500) or “investment style” (e.g., large-cap value) with fees and expenses that are as low as possible. Passive investors, like Vanguard and Dimensional Fund Advisors, and the diversified portfolios they manage reflect a large and growing component of institutional ownership, and more broadly, U.S. stock ownership.¹ This paper examines both whether and how such passive investors might influence firms’ governance structure.

At first blush, it is unclear why passive institutional investors would affect firms’ governance choices. Unwilling to accumulate or exit positions, which would lead to deviations from the underlying index weights, passive institutions lack a traditional lever used by non-passive investors to influence managers. Given their diversified holdings across hundreds of stocks, passive investors may also lack the resources necessary to research and individually monitor each stock in their portfolio. Moreover, it is unclear whether such institutional investors should even care about firm-specific policies or governance choices. Unlike actively-managed funds that attempt to outperform some benchmark, index funds and other non-index passive funds seek to deliver the performance of the benchmark, and any improvement in

¹ At the end of 2013, for example, \$1.21 trillion were invested in U.S. equity index funds alone, representing 21.2% of total U.S. equity mutual fund assets. See the 2014 Investment Company Fact Book, <http://www.icifactbook.org/index.html>. Moreover, *The Wall Street Journal* estimates that the inflows into passively managed funds in 2013 was \$336 billion, which is more than six times the amount of inflows into more traditional mutual funds during the same period. Vanguard alone surpassed \$3 trillion in assets under management in 2014. See <http://online.wsj.com/articles/investors-pour-into-vanguard-eschewing-stock-pickers-1408579101>.

one stock's performance will simply increase the performance of both the institution's portfolio and the underlying benchmark. Consistent with these arguments, interviews of investment managers at a number of large U.S. institutions suggest that many passive investors do not closely monitor firms' policy choices (Useem, Bowman, Myatt, and Irvine (1993)), and recent evidence suggests passive investors have no effect on firms' investment policies or innovation (Aghion, Van Reenan, and Zingales (2013)).

Yet, there are many reasons to expect that passive investors play a key role in affecting firms' governance choices. Because passive investors are unwilling to divest their positions in poorly performing stocks, which would lead to performance deviating from the benchmark, they may place even greater weight than that of an active fund manager on ensuring effective governance in the firms they own (Romano (1993), p.83). Additionally, if fund flows respond to absolute (rather than just relative) performance, passive managers will have an incentive to improve overall market performance because fund fees are based on assets under management, which will increase with both positive fund flows and positive performance. Passive institutions might also care about overall performance if they are a pension fund that needs to fund a pension liability (Del Guercio and Hawkins (1999)). Finally, all institutional investors have a fiduciary duty to manage their funds and vote their proxies in the best interest of shareholders. Consistent with these possible motives for influencing governance, many passive institutions publicly seek to counter the presumption that passive investors are passive owners.²

There are also many mechanisms by which passive investors might influence firms' governance. First, institutions that manage passive funds often own a sizable proportion of a firm's shares, and passive investors are keenly aware of the influence their votes can wield and actively make their views on issues related to governance known to managers.³ Managers' knowledge that these passive investors are not likely to sell their shares anytime soon may also give the views of passive investors greater weight than those of active fund managers, which tend to exhibit high turnover rates. Second, the size and concentration of passive investors' ownership stakes may facilitate activist investors' ability to rally support for their demands (Brav et al. (2008)). Bringing just a few of these large investors on board can

² For example, the title of this paper, "Passive Investors, Not Passive Owners," was the title for an article written by Glenn Booraem, controller of Vanguard, in April 2013 highlighting the care Vanguard takes when voting proxies. See <https://personal.vanguard.com/us/insights/article/proxy-commentary-042013>. Similar views regarding the distinction between being a passive investor, but active owner, were espoused by Rakhi Kumar, head of corporate governance at State Street Global Advisors in *The Financial Times* on April 6, 2014 in an article titled, "Passive investment, active ownership," and by David Booth, chairman and co-founder of Dimensional Fund Advisors, in the *New York Times* on March 16, 2013 in an article titled, "Challenging Management (but Not the Market)".

³ As noted by Rakhi Kumar, head of corporate governance at State Street Global Advisors, "The option of exercising our substantial voting rights in opposition to management provides us with sufficient leverage and ensures our views and client interests are given due consideration" (see Scott (2014)).

lend credibility to an activist campaign, and activists are known to gauge the support of a firm's largest passive institutional investors before pursuing demands from management.⁴ Finally, if acquiring the expertise to be an effective owner exhibits economies of scale, passive institutional investors may be more effective at monitoring managers than retail investors that directly hold stocks. While passive institutions may lack the resources necessary to monitor each stock in their large, diversified portfolios, they may engage in widespread, but low-cost, monitoring of firms' compliance with what they consider to be best governance practices (e.g., Black (1998)).

Identifying the impact of passive investors on firms' corporate governance and other policies can be challenging. For example, cross-sectional correlations between passive investors and governance choices might not reflect a causal relation since ownership by passive investors might be correlated with factors—such as firm size or ownership by active investors—that directly affect firms' choices. Simultaneity bias could also distort these relations. For example, passive investors may prefer to track indexes that contain a higher proportion of well-managed firms, all else equal.

To overcome these challenges and to assess whether passive investors affect firms' governance, we exploit variation in ownership by passive investors that occurs around the cutoff point used to construct two widely-used market benchmarks, the Russell 1000 and Russell 2000 indexes. The Russell 1000 comprises the largest 1000 U.S. stocks, in terms of end-of-May equity market capitalization, and the Russell 2000 comprises the next largest 2000 stocks. Passive institutional portfolios containing large-cap and mid-cap stocks that span the biggest 1000 stocks often use the Russell 1000 as a benchmark, and passive small-cap and micro-cap managers whose holdings span the next 2000 stocks are likely to use the Russell 2000 as a benchmark. The indexes are reconstituted at the end of June every year, and because portfolio weights assigned to each stock within an index are value-weighted, a stock's index assignment has a significant impact on the extent of ownership by index funds and other non-index passive funds that use the Russell indexes as benchmarks. For example, the 750th through 1000th largest stocks at the end of May will be included in the Russell 1000 and be given very small portfolio weights within the index since they represent the smallest firms in their index, while the 1001th through 1250th largest stocks will be

⁴ For example, the activist hedge fund ValueAct was successful in obtaining a board seat on Microsoft with less than 1 percent of stock because Microsoft recognized that other institutional investors backed the fund's demand. Also, passive investor Dimensional Fund Advisors, using their sizable ownership stake of 6.7 percent, helped activist investor Starboard elect three new directors to the board of Regis Corp. in late 2011 (see Sommer (2013)). And, in its fight against Agrium, the activist hedge fund Jana Partners first gauged the support it had from large institutional investors before going public with its demands. See <http://dealbook.nytimes.com/2014/03/18/new-alliances-in-battle-for-corporate-control/> for more details.

included in the Russell 2000 and be given weights in that index that are an order of magnitude larger because they represent the largest firms in their index. Therefore, for each dollar invested in a passive fund using the Russell 1000 as a benchmark, very little of it will be invested in stocks at the bottom of that index; while for each dollar invested in a passive fund using the Russell 2000 as a benchmark, a large proportion of it will be invested in stocks at the top of the index.

Because there is a comparable amount of assets benchmarked to each index (Chang, Hong and Liskovich (2014)), this benchmarking by passive funds leads to a sharp jump in ownership by passive institutional investors for stocks at the top of the Russell 2000 relative to stocks at the bottom of the Russell 1000. Defining passive investors as institutions classified as quasi-indexers by Bushee (2001), the two largest of which are Vanguard and State Street, we find that ownership by passive investors is, on average, about 2 to 4 percentage points higher for stocks at the top of the Russell 2000 index relative to stocks at the bottom of the Russell 1000 index. The difference represents about 5-10 percent higher ownership by passive investors relative to the sample average and is robust to controls for firms' market capitalizations and to choices regarding the number of firms we include on either side of the cutoff. Consistent with this difference in institutional ownership being driven by passive investors, we find no corresponding difference in ownership among more active institutions. The lack of a difference for the active institutional investors indicates the larger ownership of stocks at the top of the Russell 2000 by passive institutional investors coincides with a lower ownership of these stocks by retail investors.

To assess the effect of passive investors on firms' corporate governance, we exploit this variation in ownership around the Russell 1000/2000 cutoff in an instrumental variable (IV) estimation. Specifically, we instrument ownership by passive investors with an indicator for being assigned to the Russell 2000 in a given year. Our IV estimation relies on the assumption that after conditioning on stocks' market capitalization, which determines index assignment, inclusion in the Russell 2000 index does not directly affect our outcomes of interest except through its impact on ownership by passive investors. This assumption seems reasonable in our setting in that it is unclear why index inclusion would be directly related to governance and other corporate outcomes after restricting the sample to stocks near the Russell 1000/2000 cutoff and after robustly controlling for the factor that determines index inclusion—stocks' end-of-May market capitalization.

The governance outcomes we choose to analyze reflect those that are explicitly mentioned by some of the largest passive institutional investors as being important. For example, a common theme of

the proxy voting policies of large, passive institutional investors is (1) to either withhold support or vote against boards that are not sufficiently independent and (2) oppose antitakeover provisions that can reduce board accountability, including poison pills, restrictions on shareholders' ability to call special meetings, and dual class shares (e.g., see Vanguard (2014) and the Appendix for more details on voting guidelines of four prominent passive institutional investors). We also analyze outcomes that are directly related to the potential mechanisms by which passive investors may exert influence, such as their support for management and governance-related shareholder proposals, the types of proposals voted on, and the likelihood of a hedge fund activist making demands' upon management.

Using our IV approach, we find that passive investors have a significant impact on key aspects of firms' governance structure. In particular, we find that an increase in ownership by passive investors is associated with an increase in the share of independent directors on a board, the removal of poison pills and restrictions on shareholders' ability to call special meetings, and fewer dual class shares. The economic magnitudes are sizable. For example, relative to the sample average, a 10 percent increase in ownership by passive investors is associated, on average, with a 9 percent increase in the share of directors on a firm's board that are independent. And, a one percentage point increase in ownership by passive investors is associated with 0.5 percentage point increases in the likelihood of removing a poison pill and of reducing restrictions on shareholders' ability to call special meetings. Again, these findings are economically large given that, on average, only 4 percent of firms remove a poison pill and 0.7 percent of firms eliminate restrictions on special meetings each year during our sample period.

Our evidence suggests that a key mechanism by which passive investors exert their influence is through the power of their large voting blocs. Passive ownership is associated with a decline in the share of votes in support of management proposals and an increase in support for governance-related shareholder proposals. Relative to the sample average, a 10 percent increase in ownership by passive investors is associated with about a 4 percent decline in support for management proposals and about a 10 percent increase in support for governance proposals. These differences in support are not driven by a change in the type of proposals being voted on; we find little evidence of an association between passive investors and the composition of management or shareholder proposals.

We find less evidence of alternative mechanisms by which passive investors might influence governance outcomes. In particular, we find no evidence of a positive association between ownership by passive investors and the likelihood of a firm experiencing a hedge fund activism event, as defined by Brav et al. (2008) and Brav, Jiang, and Kim (2010). If anything, we find suggestive evidence of a *decline*

in hedge fund activism. These findings may be consistent with either the observed differences in governance reducing the need for activism or with firms recognizing passive investors' ability to lend support to hedge fund activists and taking actions so as to preempt an actual activist campaign.

The influence of passive investors is not limited to firms' governance structures. We find that ownership by passive investors is also associated with reduced cash holdings, a higher dividend yield, and lower managerial pay. Relative to the sample average, a 10 percent increase in ownership by passive investors is associated with an 8 percent decline in cash holdings, a 2 percent increase in firms' dividend yield, and a 2 percent decline in total CEO pay. However, we cannot differentiate whether these differences in corporate policy are driven by the observed differences in governance or by firms responding to an increased threat of activism by non-passive institutions that seek passive investors' support. We find no evidence that passive ownership is associated with differences in firms' overall performance or value. This lack of a difference is consistent with the findings of Brav et al. (2008) regarding the value implications of hedge fund activism related to governance, dividend, and compensation, and more broadly, with earlier evidence regarding the value implications of shareholder activism, as summarized by Black (1998), Karpoff (2001), and Gillan and Starks (2007).

Our findings are robust to various specification choices. Varying the number of stocks we investigate around the cutoff between the two indexes or varying the functional form we use to control for firms' end-of-May market cap, which is the key factor determining stocks' index assignment each year, does not affect our findings. The findings are also robust to the definition of end-of-May market cap we employ. We use the CRSP monthly file to calculate end-of-May market caps, but the findings are robust if instead we use the Compustat security monthly file or, when available, Russell's proprietary measure of total market cap. The findings are also robust to comparing firms within years and to controlling for firms' float-adjusted market cap, which is a proprietary measure used by Russell to determine a stock's ranking within indexes. Finally, the findings are robust to using a narrower definition of passive ownership that only includes the ownership stake of the three largest quasi-index institutions (Barclays Bank (which owned iShares during our sample period), State Street, and Vanguard) as the key explanatory variable, rather than Bushee's measure of the total shares held by quasi-indexers.

Overall, our findings contribute to the broad literature that studies the effects of institutional ownership of common stock. One strand of this literature analyzes institutional investors' impact on various aspects of corporate governance, including governance indices (Aggarwal et al. (2011), Chung and Zhang (2011)), CEO pay sensitivity (Hartzell and Starks (2003)), and shareholder proposals (Gillan

and Starks (2000)), while another strand studies the effects of institutional investors on corporate policies, including leverage (Michaely, Popadak, and Vincent (2014)), dividends (Grinstein and Michaely (2005)) and R&D (Bushee (1998), Aghion, Van Reenen, and Zingales (2013)). A number of recent papers also highlight the role of specific types of institutional investors, such as activist hedge funds (Brav et al. (2008); Klein and Zur (2009)) and pension funds (Agrawal (2012); Carleton, Nelson, and Weisbach (1998)). We contribute to this literature by focusing on passive institutions—a previously ignored, but increasingly important, set of institutional investors. Contrary to the presumption that passive investors lack the ability and willingness to influence firms’ policy choices, our evidence suggests that passive investors adopt general principles of what constitutes effective governance and successfully influence firms’ governance and other policy choices by voting (or withholding management support) accordingly.

The results of this paper also provide new insights into the determinants of firms’ governance structures and the mechanisms that allow large shareholders to influence managerial decisions. Importantly, we show that institutional influence over corporate actions is not limited to active institutions and their unconstrained flexibility to buy and sell positions, but extends to passive institutions as well. Typically, institutional investors, such as blockholders, are thought to influence governance through a combination of “voice” and “exit” (e.g., Edmans (2014) and Levit (2013)).⁵ Voice refers to direct intervention by shareholders through either formal (e.g., proxy voting) or informal (e.g., letters to the board) channels (Harris and Raviv (2010); Levit and Malenko (2011); Maug (1998); Shleifer and Vishny (1986)), while exit refers to the threat or actual selling of shares (Admati and Pfleiderer (2009); Edmans (2009); Edmans and Manso (2011)). However, because passive funds maintain portfolio weights that are often closely aligned with the weights in their chosen benchmark, their ability to influence managers is primarily limited to voice, which is thought to constrain their ability to influence corporate outcomes. Our paper finds otherwise; while passive investors’ are not “active” in the traditional sense, their significant voting blocs and ability to engage in voice are powerful tools used to shape the governance structure of firms and influence some aspects of corporate policy.⁶

⁵ Several papers (e.g., Shleifer and Vishny, 1986) also study the use of hostile takeovers and proxy fights by blockholders. In both cases, the large holdings of these shareholders partially mitigate free rider problems which arise in a world with atomistic owners (Grossman and Hart, 1980).

⁶ In this regard, our findings complement that of Iliev and Lowry (forthcoming), which analyzes the determinants of mutual funds’ reliance on proxy advisory service companies like Institutional Shareholder Services (ISS). While not the focus of the paper, Section 4.3 of Iliev and Lowry presents evidence that index funds are more likely to “actively vote” their shares (as measured by being less likely to follow ISS vote recommendations on non-binding shareholder proposals) when they have substantial holdings in the firm. Our findings demonstrate that the active monitoring and voice of passive investors results in actual differences in firms’ governance structures and corporate policies.

Finally, our work is related to recent papers that use the Russell 1000/2000 cutoff to analyze the association between total institutional ownership and corporate policies like payouts, investment, the composition of CEO pay, and acquisitions (Crane, Michenaud, and Weston (2014); Lu (2013); Mullins (2014)). In contrast to these papers, we analyze ownership by *passive investors*, the governance outcomes explicitly mentioned by such investors as being important (e.g., independent directors, fewer takeover defenses), and the mechanisms by which passive investors might influence such governance outcomes (e.g., proxy voting, shareholder proposals, facilitating hedge fund activism). Unlike these papers, we also do not use a regression discontinuity (RD) approach, which is inappropriate in this setting. Because of the method by which Russell reorders stocks within indexes, using within-index ranks in a RD approach (Crane, Michenaud, and Weston (2014); Lu (2013)) violates the local continuity assumption of RD, and because market capitalization (even the proprietary measure provided by Russell) is only a weak predictor of index inclusion near the cutoff, a fuzzy RD (Mullins (2014)) lacks the necessary discontinuity in treatment probability.⁷ Using our broader IV estimation to sidestep these challenges, we find no evidence that index membership is associated with differences in ownership by non-passive institutional investors, thus allowing us to isolate the effects of passive investors, and no evidence of differences in firms' investment activities, acquisitions, and leverage, consistent with anecdotal evidence that passive investors are less focused on and less likely to influence these types of corporate policies.

The remainder of this paper is organized as follows. Sections II and III describe our data and identification strategy. Section IV describes our findings regarding corporate governance, while Section V discusses potential mechanisms. Section VI describes our findings regarding other corporate outcomes. Section VII discusses our specification choice and robustness tests, and Section VIII concludes.

II. Sample, data sources, and descriptive statistics

In this paper, we use the following data for individual common stocks: institutional holdings from 13F filings; price and shares outstanding; and Russell equity index membership. We then merge these stock-level data with firm-level governance, proxy voting, accounting, and executive compensation data. We now briefly describe each data source and our sample.

A. Institutional holdings and Russell 1000/2000 index membership

We use the 13F holdings data to compute institutional holdings in a stock as a percent of its market capitalization. Any financial institution exercising discretionary management of investment

⁷ The challenges of RD estimation in this setting are further explained in Section VII.

portfolios over \$100 million in qualified securities is required to report those holdings quarterly to the SEC using Form 13F. Qualified securities include stocks listed for trading in the US, among other securities, and the quarterly holdings reported in Forms 13F represent the aggregate holdings of an institution (e.g. the Vanguard family of funds), rather than the holdings of any individual portfolio (e.g., the Contra fund in the Fidelity family of funds). These filings are compiled by Thomson/CDA and available through Wharton Research Data Services (WRDS).⁸ We calculate the total market cap of each stock using the CRSP monthly file as the sum of shares outstanding multiplied by price for each class of common stock associated with a firm (i.e., we sum across all PERMNOs associated with each PERMCO). We exclude observations where institutional holdings exceed a firm's market capitalization.

In addition to overall institutional holdings, we use Bushee's (2001) three sub-categories of institutional investors, based on portfolio diversification and turnover, to distinguish between index/passive and active institutional ownership. Specifically, we use Bushee's three "permanent" institutional categories: (i) "quasi-indexers" (low turnover, high diversification – e.g., Vanguard and State Street are two of the largest institutions in this category); (ii) "transient" (high turnover, high diversification – e.g., Janus Capital Management, Morgan Stanley); and (iii) "dedicated" (low turnover, low diversification – Berkshire Hathaway, Wellington (Windsor)).⁹ To generate variables for institutional ownership disaggregated into these three types, we compute the percentage of the market capitalization for stock i at time t owned by quasi-indexers, transient, and dedicated institutions.

Combined, the 13F data and Bushee's categorization of institutional investors confirm the growing importance of passive investors. This is seen in Figure 1, which plots the quarter-end percentage of total U.S. market value held by quasi-indexers from June 30, 1984 to June 30, 2010. As shown in the top panel of Figure 1, holdings by passive investors have steadily grown over the last three decades, except for a small drop-off after the 2008 financial crisis. The growing importance of passive investors is particularly stark among smaller capitalization stocks. This is seen in the next two panels of Figure 1 where we plot quasi-index ownership for firms found in the Russell 1000, which reflects the largest 1000 firms in terms of market cap, and the Russell 2000, which reflects the next 2000 largest

⁸ On occasion, an institution will report its holding late, so that the report date and filing date in the Thomson data are not the same. As these holdings are not current, we delete them from our analysis. We also correct for the two transcribing errors—errors relating to incorrect prices and incorrect split adjustment factors for the fourth quarter of 1999 and the third quarter of 2000—identified in Blume and Keim (2014).

⁹ See Bushee's Website for details: <http://acct.wharton.upenn.edu/faculty/bushee/IIclass.html>.

firms. Quasi-indexers owned less than 14% of the combined value of the stocks in the Russell 2000 index in June 1984, and more than 40% in June 2010 (down from 48% in March 2008). In contrast, quasi-index ownership in the Russell 1000 stocks grew from 29% to just over 46% during the same period.

Because we are interested in whether an increase in ownership by an institution that tends to offer passive funds, like Vanguard or State Street, is associated with differences in governance or corporate policies, we define passive ownership at the institutional level (using the aggregated 13F data and Bushee's quasi-index classification) rather than at the fund level. Proxy voting guidelines, particularly those regarding governance, are established at the level of the institution (e.g., see Appendix in Section IX), and consistent with this, Rothberg and Lilien (2006) and Rock (2014) find that voting decisions are made at the family level and that funds within an institution almost always vote uniformly as a block. Thus, the influence of these passive institutions is likely to reflect the totality of their holdings rather than the holdings of a given fund; and while many of the largest passive institutions, such as Vanguard and State Street, also offer some actively-managed funds, our later findings demonstrate that there is no evidence that ownership by actively-managed funds varies based on a stock's index assignment.

Our subsequent analysis is restricted to the sample of stocks found in the Russell 1000 and 2000 indexes between 1998 and 2006. We obtain data for the Russell 1000 and 2000 indexes from Russell Investments, and we start the sample at 1998 because this is the first year Russell provides us with its proprietary, float-adjusted market capitalization which is used to determine the rank (i.e. portfolio weight) of each security within an index. We end the sample prior to 2007, which is when Russell implemented a new methodology to construct the two indexes such that they no longer necessarily reflect the 1000 and next 2000 largest stocks by market capitalization. Russell also provided us with their proprietary end-of-May total market capitalization values for each year from 2002 to 2006. The importance of the end-of-May market capitalizations, of controlling for float-adjusted market capitalization, and of ending the sample prior to the beginning of this new policy is described in Section III.

B. Governance, voting, accounting, and compensation data

Governance and voting data are largely obtained from Riskmetrics (ISS), which provides information on several aspects of corporate governance for firms in the S&P 1500. Following Riskmetrics' classification of a director's independence, which excludes linked directors (e.g., those with business ties to the firm), we calculate the percentage of independent directors on the boards of each firm

for each year in the sample from the director dataset. The governance dataset from Riskmetrics is used to create indicator variables for whether a firm removes restrictions on shareholders' ability to call a special meeting or has dual class shares in a given year. The governance database is available for alternating years in the sample, except for 1998 when there is a 3 year lag. We also construct several variables related to shareholder proposals and voting. We use the voting results database from Riskmetrics to calculate the average percentage of shares that vote in support of management proposals at annual meetings and in support of shareholder-initiated governance proposals for each firm. Because annual meetings can occur throughout a year, we restrict the sample to those occurring between reconstitutions of the Russell indexes (i.e., between July of year t and June of year $t+1$).

Our data on poison pills are obtained from Shark Repellent (FactSet). Shark Repellent provides historical information on firms' most recent poison pill, such as when the poison pill was renewed, withdrawn, or allowed to expire. We define our variable for poison pill removal as an indicator equal to 1 if a firm's poison pill is either withdrawn or allowed to expire at time t , and zero otherwise.¹⁰

Annual accounting data are from Compustat, and we use executive compensation data from Execucomp. Accounting variables are winsorized at the 1% and 99% levels. Definitions for all our key variables are provided in Appendix Table 1.

C. Descriptive statistics

Table 1 reports summary statistics for firms in the 250 and 500 bandwidths around the cutoff. The mean and median values of the main outcome variables are similar across both bandwidths. The average level of institutional ownership (as a percentage of shares outstanding) is 64%. Quasi-indexers are the largest type of institutional investors (approximately 38% of shares outstanding), followed by transient (16%) and dedicated (9%). Support for management proposals is high (85%), consistent with the notion that many of the issues addressed by these proposals are routine in nature, while support for shareholder-initiated governance proposals is considerably lower (36%). Independent directors make up over half (65%) of the total number of directors for firms in the sample. The table also shows that poison pill removals and the lessening of restrictions on shareholders' ability to call a special meeting are relatively rare events in our sample, occurring in just 4% and 0.7% of firm-year observations, respectively. About 12% of firms have dual class shares. Finally, the dividend yield averages about 0.15.

¹⁰ Because Shark Repellent only reports information on a firm's most recent poison pill, our indicator only flags firms that removed a poison pill during our sample period and did not reinstate a poison pill subsequently.

III. Empirical framework

Identifying the impact of passive investors on firms' corporate governance and other policies can be challenging. For example, cross-sectional correlations between passive investors, governance, and corporate policies might not reflect a causal relation since ownership by passive investors might be correlated with factors—such as firm size or ownership by active investors—that directly affect firms' choices. Failure to control for such factors could introduce an omitted variable bias that confounds the cross-sectional relations. Simultaneity bias could also distort these relations, as passive ownership, governance, and corporate policies are likely jointly determined; for example, passive investors may prefer to track indexes that contain firms with more independent directors and more payouts, all else equal. To overcome these challenges and to determine the importance of passive investors, we use stocks' assignment to the top of the Russell 2000 index as an exogenous shock to ownership by passive investors. We now describe our identification strategy.

A. Russell index construction and passive institutional investors

Passive funds attempt to match the performance of a market index by holding the basket of representative securities in the particular market index being tracked and weighting each security in proportion to the security's market capitalization weight in the market index. The most visible types of passive funds are index funds, which hold nearly all stocks in the market index rather than a representative sample. Such replication portfolio strategies can be effectively implemented for liquid, large-cap stocks like those in the S&P 500 Index, but are often infeasible when the investment focus is on smaller less-liquid stocks (Keim (1999)). As a result, there are a large number of passive investors whose portfolio weights approximate but do not match the benchmark weights.

Two market indexes widely used as benchmarks are the Russell 1000 and Russell 2000 indexes. The Russell 1000 comprises the largest 1000 U.S. stocks, in terms of market capitalization, while the Russell 2000 comprises the next largest 2000 stocks. Example index and non-index passive funds that use the Russell 1000 as a benchmark are the Vanguard Russell 1000 Index Fund (VRNIX) and the BNY Mellon Large Cap Stock Fund (MPLCX), while the Vanguard Russell 2000 Index Fund (VRTIX) and DFA U.S. Small Cap Fund (DFSTX) are two funds that use the Russell 2000 as a benchmark.

To account for changes in stocks' ranking by market cap, the Russell indexes are reconstituted each year at the end of June. On the last Friday of June, Russell Investments determines which stocks will be included in the two indexes for the following twelve months using market capitalization as of the

last trading day in May of that year.¹¹ In other words, the 1000 largest stocks at the end of the last trading day in May will be included in the Russell 1000, while the next 2000 largest stocks will be included in the Russell 2000.¹² Each stock's portfolio weight in the index is then determined using the stock's float-adjusted market cap. The float-adjusted market capitalization is different than the market capitalization used to determine index membership in that it only includes the value of shares that are available to the public. For example, shares held by another company or individual that exceed 10% of shares outstanding, by another member of a Russell index, by an employee stock ownership plan (ESOP), or by a government will be removed when calculating a firm's float-adjusted market capitalization, as will unlisted share classes. Therefore, a stock that was the 1,000th largest stock in total market capitalization need not be the stock with the smallest portfolio weight in the Russell 1000 index.

A stock's index assignment can have a significant impact on its portfolio weight within its index. Because stocks at the bottom of the Russell 1000 pale in size compared to the largest stocks in that index, the 1000th largest stock at the end of May will be included in the Russell 1000 and be given a very small portfolio weight within its index, while the 1001th largest stock will be included in the Russell 2000 and be given a much larger weight in its index. For example, between 1998 and 2006, the average portfolio weight of the bottom 250 stocks in the Russell 1000 was 0.012%, while the average portfolio weight of the top 250 stocks in the Russell 2000 was an order of magnitude larger at 0.127%. This difference in portfolio weights persists over a wide range around the cutoff. This is seen in Figure 2, where we plot the portfolio weights of the 500 smallest float-adjusted stocks in the Russell 1000 and the 500 largest float-adjusted stocks in the Russell 2000 for the year 2006.

These differences in portfolio weights can have a significant impact on the extent of a stock's ownership by passive investors. Because index funds weight their holdings based on the portfolio

¹¹ However, when the last Friday of June falls on the 29th or 30th, the two indexes are reconstituted on the preceding Friday. During the following twelve months, stocks are only deleted from the indexes due to Chapter 7 bankruptcy filings, delistings, and corporate actions (takeovers), while IPOs are added quarterly to the indexes on the basis of the market capitalization breaks established during the most recent reconstitution. For more details regarding the reconstitution process and eligibility for inclusion in the Russell indexes, please see Russell Investments (2013).

¹² Beginning in 2007, Russell implemented a "banding" policy where firms within a certain range of the cutoff would not switch indexes. For example, a firm that was in the Russell 2000 index last year but was among the 1000 largest firms this year would only move to the Russell 1000 index if its market capitalization exceeded a certain threshold. Since our identification strategy relies on controlling for the factors that determine a firm's index assignment each year, we restrict our attention to years prior to the implementation of this banding policy where only the end-of-May market capitalization calculated by Russell is used to determine firms' index assignment. For a press release regarding the implementation of this banding policy by Russell, see <https://www.russell.com/us/news/press-release.aspx?link=press-releases/2007/PR20070403.htm>, and for more details on how the banding thresholds are determined each year, see Russell Investments (2013).

weights of the underlying index in an attempt to minimize tracking error, it is more important that they match the weights of the stocks at the top of the index than for stocks at the bottom of the index. Likewise, non-indexed passive investors will pay more attention to deviations from benchmark weights for the largest stocks in their portfolios because such deviations will have a greater impact on performance measured relative to the benchmark. In other words, for each dollar invested in a passive fund benchmarked to the Russell 1000, very little of it will be invested in stocks at the bottom of that index, while for each dollar invested in a passive fund benchmarked to the Russell 2000, a large proportion of it will be invested in stocks at the top of the index. Because there is a comparable amount of money benchmarked to both indexes (Chang, Hong and Liskovich (2014)), the portfolio decisions of passive institutions can lead to a large difference in ownership between stocks at the top of the Russell 2000 and stocks at the bottom of the Russell 1000.

The importance of index assignment for ownership by passive investors is shown in Figure 3, where we sort the top 500 stocks of the Russell 2000 and bottom 500 stocks of the Russell 1000 using their end-of-May CRSP market capitalization for each year between 1998 and 2006 and plot the average market capitalization, share of firms in the Russell 2000, and percent ownership by quasi-index institutional investors. By construction, the top panel of Figure 3 shows no break in size between the 500th and 501st largest stocks in this sample. But, as shown in the middle panel, there is a rather large jump in the probability of being assigned to the Russell 2000 index around this break. The middle panel of Figure 3 also demonstrates that the end-of-May market capitalization reported by CRSP does not perfectly predict a stock's index assignment. This is because Russell makes a number of adjustments when calculating its proprietary market capitalization values such that these values, which are used to determine a stock's index membership, do not perfectly match market capitalizations reported in sources such as CRSP. And consistent with index assignment having an important impact on ownership, the bottom panel of Figure 3 demonstrates a distinct jump in the ownership of passive investors around this midway point. On average, quasi-index investors owned 40.4% of the top 500 firms of the Russell 2000, but only owned 37.8% of the bottom 500 firms in the Russell 1000 (p -value of difference < 0.001).¹³

¹³ The difference of 2.6 percentage points corresponds well to estimates regarding the total amount of passive assets tracking each of the two indexes. For example, taking the estimated dollar value of passive assets benchmarked to each index from 1998 to 2006, as reported Table 1, Panel A of Chang, Hong, and Liskovich (2014), one can calculate the percent of total holdings in both indexes that is held by passive funds that track that specific index. Using this back-of-the-envelope calculation, the implied passive holdings in the Russell 2000 index should be about 1.8 percentage points greater, on average, than that of the of the Russell 1000 index during our sample period.

The importance of index assignment for passive ownership is further highlighted by looking at the ownership stake of the three biggest passive institutions classified as quasi-index investors—Vanguard, State Street, and Barclays Bank (which owned iShares during our sample). These three institutions account for half of the observed difference in quasi-index ownership, and on average, the ownership stake of each of these three institutions is a third higher among the 500 firms at the top of the Russell 2000 relative to the bottom 500 firms of the Russell 1000. Moreover, their likelihood of owning more than 5 percent of a firm’s shares, is higher, on average by two thirds for firms at the top of the Russell 2000, while their likelihood of being a top 5 shareholder is higher, on average, by 15 percent.

We find no evidence that index assignment is related to institutional ownership associated with actively-managed funds. This is shown in Appendix Figure 1, where we plot the percent ownership for the 500 stocks on both sides of the cutoff by transient and dedicated institutional investors as defined by Bushee. As seen in Appendix Figure 1, there is no corresponding difference in either transient or dedicated institutional ownership. While some quasi-index institutions may also offer actively-managed funds, the lack of a difference for other types of institutional holdings suggests the difference in quasi-index ownership shown in Figure 3 is being driven by passive funds rather than active funds.

B. Identification strategy and empirical specification

The construction of the Russell 1000 and 2000 indexes thus provides a source of exogenous variation in ownership by passive investors. Stocks at the top of the Russell 2000 exhibit greater ownership by passive investors because of their inclusion at the top of their index, while stocks at the bottom of the Russell 1000 do not. Because index assignment is determined by an arbitrary rule surrounding the market capitalization of the 1000th largest firm, this variation in ownership is plausibly exogenous after conditioning on firms’ market capitalization.

We use an instrumental variable strategy to identify the effect of ownership by passive institutional investors on firms’ corporate governance and corporate policies; in particular, we use inclusion in the Russell 2000 as an instrument for ownership by passive investors.¹⁴ Because index assignment is determined by a stock’s market capitalization, and because market capitalization may directly affect a stock’s institutional ownership for reasons separate from the index to which the stock is

¹⁴ In contrast to other recent papers that analyze the Russell 1000/2000 index compositions using a regression discontinuity estimation, we rely on a broader instrumental variable estimation. In Section VII.A., we explain why using regression discontinuity estimation in this setting is inappropriate and can lead to distorted inferences regarding the impact of institutional investors.

assigned, we also include a robust set of controls for stocks' end-of-May market capitalization in our estimation. Specifically, we estimate the following:

$$Y_{it} = \alpha + \beta Quasi-index_{it} + \sum_{n=1}^N \theta_n \left(Ln(Mktcap_{it}) \right)^n + \gamma Ln(Float)_{it} + \delta_t + \varepsilon_{it} \quad (1)$$

where Y_{it} is the outcome of interest for firm i in year t , $Quasi-index_{it}$ is the percent of a firm's shares held by quasi-indexers in year t , $Mktcap_{it}$ is the end-of-May CRSP market capitalization of stock i at in year t , and $Float_{it}$ is the float-adjusted market capitalization used by Russell to determine a stocks' portfolio weight within its assigned index. Because $Mktcap$ is used by Russell to determine a stock's index assignment, we demonstrate the robustness of our subsequent findings to the functional form used to control for $Ln(Mktcap)$ by varying the polynomial order of controls, N , between 1 and 3. We also include year fixed effects, δ_t , to ensure that our estimates are identified using within-year variation in ownership and are not driven by the aggregate upward trend in ownership by passive investors (see Figure 1). Finally, we cluster the standard errors, ε , at the firm level.¹⁵

To account for the possibility that ownership by passive investors, as measured using *Quasi-index*, might be correlated with the error term, ε , because of the omitted variable and simultaneity issues discussed above, we instrument for ownership by passive investors using index assignment. Specifically, we instrument *Quasi-index* in the above estimation using $R2000_{it}$, which is an indicator equal to one if stock i is part of the Russell 2000 index in year t . As shown in Figure 3, being assigned to the Russell 2000 is associated with a significant jump in ownership by passive investors for stocks at the top of Russell 2000 relative to stocks at the bottom of the Russell 1000.¹⁶

Our IV estimation relies on the assumption that after conditioning on stocks' market capitalization and float-adjusted market capitalization, inclusion in the Russell 2000 index is associated with an increase in *Quasi-index* (relevance condition) but does not directly affect our outcomes of interest except through its impact on ownership by passive investors (exclusion restriction). While the relevance

¹⁵ We do not include firm fixed effects in our estimation since only a small fraction of our sample firms switch indexes at some point during the sample and because many of the governance and corporate outcomes we study are likely to be affected by sustained rather than transitory variation in passive ownership. Since firm fixed effects will remove this sustained variation, they will likely not capture the relevant variation and thus potentially provide misleading inferences (e.g., see McKinnish (2008); Gormley and Matsa (2014)).

¹⁶ The instrumental variable (IV) estimation is implemented using the standard two-stage least squares (2SLS) estimation, where *Quasi-index* is regressed onto $R2000$ and other controls from Equation (1) in the first stage, and the predicted values for *Quasi-index* are then used in the second stage estimation of Equation (1). To ensure the standard errors are correctly estimated, we implement the 2SLS estimation using Stata's `ivregress` command.

condition is easily verified in our below first stage estimations, the exclusion restriction cannot be formally tested. The exclusion restriction, however, seems reasonable in our setting in that it is unclear why index inclusion would be directly related to our outcomes of interest after robustly controlling for the factor that determines index inclusion—firms’ end-of-May market capitalization, as calculated by Russell. To control for firms’ market capitalization, we include a robust set of controls for firms’ log market capitalization, $\text{Ln}(Mktcap)$, as measured using CRSP data and restrict our sample to stocks at the bottom of the Russell 1000 and top of the Russell 2000.¹⁷ We also control for float-adjusted market capitalization because it is used by Russell to sort firms within each index and could be related to a firm’s stock liquidity, which may affect firms’ governance and other corporate outcomes (Back, Li, and Ljungqvist (2014); Edmans, Fang, and Zur (2013)). Finally, we also show the robustness of our findings to varying the number of firms we include around the cutoff between the two indexes and to varying the polynomial order we use to control for end-of-May market capitalization. Besides our controls for market capitalization and float-adjusted market cap, we deliberately do not control for any other time-varying accounting variables because these variables could be affected by the difference in passive ownership, and their inclusion could thus confound estimates of β .¹⁸

C. First stage estimation

In this section, we report estimates of our first-stage regression of quasi-index holdings on membership in the Russell 2000 index plus additional controls. Specifically, we estimate

$$Quasi-index_{it} = \eta + \lambda R2000_{it} + \sum_{n=1}^N \chi_n (\text{Ln}(Mktcap_{it}))^n + \sigma \text{Ln}(Float)_{it} + \delta_t + u_{it} \quad (2)$$

where $Quasi-index_{it}$ is the percentage of shares outstanding owned by quasi-indexers, $R2000_{it}$ is a dummy variable equal to 1 if stock i is in the Russell 2000 Index at end of June in year t , $Mktcap_{it}$ is the market value of equity of stock i measured at May 31 in year t , $Float_{it}$ is the float-adjusted market value of equity

¹⁷ At some level, our estimation can be viewed as one that makes use of a threshold event in a non-RD estimation, as discussed in Bakke and Whited (2012). Given this, we demonstrate the robustness of our findings to using different polynomial order controls for $\text{Ln}(Mktcap)$, to varying bandwidths around the threshold, and to including additional controls to further mitigate concerns regarding omitted variables that might both affect our outcomes of interest and exhibit a nonlinear relation with the variable that determines index assignment, $Mktcap$. Our findings are also robust to using alternative measures of market capitalization; see Section VII.B.

¹⁸ Because assignment to the Russell 2000 index is associated with an increase in $Quasi-index$ but does not directly affect our outcomes of interest (after conditioning on market capitalization) except through its impact on passive ownership, β , in Equation (1) measures the change in the dependent variable caused by the change in passive ownership. If we include endogenous controls, then β might be biased (Angrist and Pischke, pp. 64-66).

(provided by Russell) at June 30 in year t , and δ_t are year fixed effects. In our initial tests, we also analyze other outcome measures, including the percentage of shares outstanding owned by all institutional investors; the percentage of shares outstanding owned by “dedicated” institutions; and the percentage of shares outstanding owned by “transient” institutions. The model is estimated over the 1998-2006 period, and uses a bandwidth of 500 firms and a third-order polynomial.

The results, reported in Table 2, show that institutional ownership is related to membership in the Russell, particularly for passive institutions. The first column shows that aggregate institutional percentage ownership is significantly higher (at the 10% level) for the 500 stocks at the top of the Russell 2000 than for 500 stocks at the bottom of the Russell 1000. As expected, this relation appears to be driven entirely by passive institutions: the estimated coefficient is positive and significant at the 1% level for the quasi-indexers (column 2), but insignificant for the active institutional investors, as defined by Bushee’s dedicated and transient institutions (columns 3 and 4). The lack of a difference for other institutional investors suggests that the increase in ownership by passive institutional investors coincides with a decline in ownership not reported in the 13F filings, i.e. retail investors.¹⁹

In Table 3 we demonstrate that the estimated relation between quasi-index ownership and Russell 2000 membership is robust to using lower order polynomials and smaller bandwidths. Using a bandwidth of 500 firms and varying the polynomial order of controls for market cap, we consistently find an increase in ownership by passive investors of 3 to 4 percentage points, which corresponds to about a 10 percent increase relative to the sample average (Table 3, columns 1–3). The increase is also robust to restricting our sample to the bottom 250 stocks of the Russell 1000 and top 250 stocks of the Russell 2000 (columns 4–6). In all cases, the increase is statistically significant at the one percent level.²⁰

The lack of a difference in ownership for non-passive institutional investors is also robust to varying the sample bandwidth and the polynomial order of controls for *Mktcap*. This can be seen in Appendix Tables 2 and 3. Consistent with actively-managed funds being unaffected by a stock’s index assignment, we find no evidence of a difference in ownership by more active institutional investors, as captured by Bushee’s dedicated and transient institutions. Combined, these findings confirm that assignment to the Russell 2000 increases a stock’s relative mix of passive institutions.

¹⁹ The differences in ownership for the three types of investors do not perfectly sum to the overall difference in institutional ownership because of the small number of institutions that are unclassified in Bushee’s database.

²⁰ We do not conduct an overidentification test of our instrument since our IV estimation is just-identified (i.e., we have one endogenous regressor and one instrument).

IV. How passive investors affect firms' corporate governance

Many of the largest passive investors, like Vanguard and State Street, express strong views regarding what constitutes effective governance. In particular, they support greater board independence and oppose takeover defenses, like poison pills, restrictions on shareholders' ability to call special meetings, and dual class shares (see Appendix). But, do passive investors, whose impact is limited to "voice," have an effect on corporate governance? In this section, we investigate these questions using the identification strategy and instrumental variable estimation described in Section III.

A. Independent directors

We first assess whether passive institutions exert influence on board composition, as measured by the percentage of independent directors on the board. Increasing the percent of independent directors is a specific concern of many passive investors (see Appendix) and is one dimension of governance where passive investors have a direct say via their proxy votes in director elections. Passive investors support for independent director likely stems from the belief that independent directors are more likely to be effective monitors (Fama and Jensen (1983), Weisbach (1988)). Table 4 reports results for our IV estimation using percentage of independent director as the dependent variable. To demonstrate robustness, we estimate the model for bandwidths of 500 and 250, and for three orders of polynomial controls for $\text{Ln}(Mktcap)$, as well as a control for float-adjusted market capitalization and year fixed effects.

We find that passive investors do indeed have a significant impact on this key dimension of corporate governance. We find a statistically significant positive relation (in most cases at the 1% level) between *Quasi-index* and the percentage of independent directors that is robust to various bandwidths and polynomial order controls for market capitalization. The economic magnitude of the relation is sizable. In the bandwidth of 250 stocks, a 1 percentage point increase in ownership by passive investors is associated with a 1.42 to 1.58 percentage point increase in number of independent directors on a firm's board (Table 4, columns 4–6). Relative to the sample average, this corresponds to a 9 percent increase in the share of directors that are independent for a 10 percent increase in shares outstanding held by *Quasi-index* institutions. In unreported analysis, we find this increase in director independence is not driven by an increase in board size; to the contrary, greater ownership by passive institutions is associated with smaller boards. The magnitudes for board independence are smaller, but still large and statistically

significant, in the wider bandwidth of 500 stocks (columns 1–3).²¹

B. Poison pill removals, ability to call special meetings, and dual class shares

We now consider the association between passive investors and three additional dimensions of corporate governance related to takeover defenses – poison pills, restrictions on shareholders’ ability to call special meetings, and dual class shares. Opposition to takeover defenses are common themes of passive investors’ proxy voting guidelines (see Appendix). Table 5 reports the results of our IV estimation for each of these variables, and for brevity, we only report findings using the smaller bandwidth of 250 firms. Findings when using the wider bandwidth of 500 firms are qualitatively similar.

While poison pills may be in shareholders’ interests under some circumstances, they are often seen as a mechanism used to shelter managers from the disciplining effects of hostile takeovers. Specifically, poison pills (formally known as “shareholder rights plans”) effectively bar any single shareholder from acquiring more than a pre-defined percentage of shares (often between 10 and 15 percent) without significantly diluting their holdings (Bebchuk, Cohen, Ferrell (2009)). While Coates (2000) notes that essentially every firm has a “shadow pill” in place because a pill may be implemented by a board at any time without shareholder approval, having a poison pill in place is still thought to provide managers with advantages in fighting off hostile bids and unwanted activists.²² Moreover, institutional investors widely call for the redemption of poison pills and support efforts to subject them to shareholder votes in order to improve the accountability of managers and boards.²³

We find evidence that ownership by passive investors is associated with an increase in the removal of poison pills. To determine the influence of passive institutions on the removal of poison pills,

²¹ Because Riskmetrics only covers firms in the S&P 1500, the sample size in Table 4 is about a third smaller than the first stage estimates reported in Table 3. However, this reduced sample size does not pose a problem for our estimation. There is a similar coverage of observations by Riskmetrics across the two indexes; in our sample that includes the bottom 500 firms of the Russell 1000 and the top 500 firms of the Russell 2000, 58.3% of the Russell 2000 observations are in the S&P 1500 while 59.7% of the Russell 1000 observations that are in the S&P 1500. The balance is also similar in each of the separate Riskmetrics databases we use. More importantly, the first stage estimates in the smaller sample of observations with non-missing data on director independence remain large and statistically significant. This can be seen in Appendix Table 4A. The first stage estimates for our later estimates in Tables 5, 6, and 9 can be found in Appendix Tables 4B-4D, respectively. We do not separately report first stage estimates for Tables 7 & 8 since their samples are comparable to that used in Table 3.

²² As noted by Bebchuk, Cohen, and Ferrell (2009), “having a pill in place saves the need to install it in ‘the heat of battle’... [and] signals to hostile bidders that the board ‘will not go easy’.”

²³ For example, Dimensional Fund Advisors has a policy to vote against or withhold votes for directors of corporations that have poison pills with a “dead hand” provision (i.e., those that cannot be redeemed by new directors) or that are not approved by shareholders. See the Appendix in http://us.dimensionalfund.com/media/documents/downloads/pub/pdf/sai/idg_equity_i_sai.pdf. The views of other large passive institutions, such as Vanguard, regarding poison pills can be found in the Appendix.

we estimate equation (1) with an indicator variable equal to one if the firm's poison pill is either withdrawn or allowed to expire and zero otherwise. These estimates are reported in Table 5. The estimated coefficient when using a first- or second-order polynomial control for $\text{Ln}(\text{Mktcap})$ is positive and statistically significant (at the 10% level). A one percentage point increase in *Quasi-index* is associated with a 0.5–0.6 percentage point increase in the likelihood of a poison pill being removed (Table 5, columns 1–2). We find a similar magnitude when adding a third-order polynomial control for market cap, but the estimate is not statistically significant at conventional levels (column 3). The estimate is economically sizable given that, on average, only 4 percent of firms remove a poison pill each year.

We next analyze whether ownership by passive investors is associated with a greater ability for shareholders to call a special meeting, another important aspect of governance (Daines and Klausner (2001); Cremers and Nair (2005)). Similar to poison pills, restrictions on shareholders' ability to call special meetings can represent a potential impediment to effective governance by delaying dissident shareholders' ability to remove directors, and such restrictions, especially if combined with a poison pill, are also seen as an effective takeover defense for entrenched managers (Daines and Klausner (2001)). To assess the ability of passive institutions to reduce restrictions on shareholders' ability to call special meetings, we estimate equation (1) with an indicator variable equal to one if the firm eliminates such restrictions, and zero otherwise. These estimates are reported in columns 4–6 of Table 5.

We find evidence that ownership by passive investors is associated with the removal of restrictions on shareholders' ability to call special meetings. The estimated coefficient is positive and statistically significant in all of the estimations; in particular, a one percentage point increase in *Quasi-index* ownership is associated with about a 0.5 percentage point increase in the likelihood that a firm eliminates restrictions on shareholders' ability to call special meetings. Relative to the average share of firms that lift restrictions each year in our sample, which is about 0.7 percent, the magnitude is sizable.

Finally, we consider whether ownership by passive investors is associated with whether or not a firm has dual class shares, as determined by Riskmetrics. By concentrating voting power among insiders, Klausner (2012) argues that dual class shares are one of the most powerful takeover defenses, and Gompers, Ishii, and Metrick (2010) find evidence that dual class shares can significantly impact firm value. Moreover, passive institutions uniformly oppose dual class shares and other forms of unequal voting rights (see the Appendix for examples). To assess whether ownership by passive institutions is associated with fewer dual class share structures, we construct an indicator that equals one if the firm has dual class shares, and zero otherwise. These estimates are reported in columns 7–9 of Table 5. We find

evidence that ownership by passive investors is associated with firms being less likely to have dual class shares. The estimated coefficient is negative and statistically significant (at the 5% level) in all of the estimations; a one percentage point increase in *Quasi-index* ownership is associated with about a 5 percentage point decrease in the likelihood that a firm has dual class shares.²⁴

V. Possible mechanisms by which passive investors influence governance

There are many possible mechanisms by which passive investors might influence a firm's governance structure. First, relative to retail investors they displace at the top of the Russell 2000, passive investors may have stronger, more uniform views on what constitutes an effective governance structure and may be more effective at using their ownership stake and "voice" to monitor firms and ensure conformity with their views. Second, relative to the dispersed retail investors they replace, passive investors' concentrated ownership may facilitate activism by others, such as hedge funds, by lowering the costs for activists attempting to coordinate votes against management (Brav et al. (2008)). In this section, we investigate these possible channels.

A. The power of passive investors' "voice"

To address whether passive investors' influence firms' governance through their large voting blocs and the power of voice such blocs can wield, we analyze whether passive ownership is associated with a difference in the amount of shareholder support for management proposals and support for governance-related shareholder proposals. We also analyze whether passive ownership is associated with a shift in the types of proposals being voted on.

We first analyze the amount of support for management proposals. Shareholder voting at annual meetings is a fundamental duty of shareholders, and votes against management proposals can be a proxy for increased monitoring by shareholders (Easterbrook and Fischel (1983)). It is also argued that

²⁴ Unlike poison pills and restrictions on shareholders' ability to call special meetings, we do not find evidence that passive ownership is associated with firms being more likely to remove dual class shares. We only find an association between passive ownership and the indicator for whether a firm has dual class shares. While the estimates for the removal of dual class shares are suggestive, they are not statistically significant. In unreported analysis, we also analyzed the impact of passive ownership on whether firms have a classified board, another type of takeover defense that passive institutions typically oppose (see Appendix). We find suggestive evidence that passive ownership is also associated with firms being less likely to have a classified board, but the estimates are not statistically significant at conventional levels. The statistically weaker results for classified boards may partially be an artifact of the time period of our sample; Guo, Kruse, and Nohel (2008) note that shareholder efforts to de-classify boards intensified significantly in 2003 following the passage of Sarbanes-Oxley. However, we have only two years of observations for governance provisions after 2003.

institutional passive investors may be more attentive and active in voting than retail investors that directly hold stocks but lack the time or experience to evaluate management proposals. To assess whether passive institutions influence voting outcomes, we estimate equation (1) with the dependent variable defined as the average percentage of shares that vote in support of management proposals. The results are in columns 1–3 of Table 6 where we again report estimates for a bandwidth of 250, and for three orders of polynomials, as well as a control for float-adjusted market capitalization and year fixed effects.

Consistent with increased monitoring of managers, we find that greater ownership by passive investors is associated with less support for management proposals. The estimated coefficients are negative and statistically significant (in two cases at the 1% level), indicating that the greater is the percentage of passive institutional ownership, the lower is the shareholder support for proposals initiated by management. Again, the economic magnitudes are sizable. On average, a one percentage point increase in ownership by passive investors is associated, on average, with a 0.85 to 1.07 percentage point decline in support for management proposals. Relative to the sample average, this corresponds to about a 4% decline in support for a 10% increase in ownership by *Quasi-index* institutions. Consistent with institutional investors being more attentive than individual retail investors, management appears to be confronted with a more contentious shareholder base when passive investors, who are less able to vote with their feet, make up a larger percentage of the ownership.

The decline in support for management proposals does not originate from a shift in the number or type of management proposals put to a vote. In unreported analysis, we find that greater ownership by passive investors is not associated with the total number of management proposals, and we find little evidence of an association with the composition of proposals. Specifically, we consider the prevalence of the 25 most common types of management proposals (which account for about 85% of management proposals), and with the exception of fewer proposals related to adoption of equity incentive plans and the approval of bonus plans, we detect no systematic difference in the types of proposals voted on. The lack of difference in the composition of proposals suggests the lower support for management proposals is not driven by managers submitting a greater number of less-shareholder-friendly proposals.²⁵

We next analyze support for shareholder proposals and find evidence that ownership by passive

²⁵ We also only find weak evidence that the lower support for management proposals translates into fewer management proposals being passed; the point estimates are negative, but not statistically significant at conventional levels. See Appendix Table 5, columns 1-3. The lack of difference in the total number of proposals passed is likely attributable to many management proposals being related to routine business matters.

investors is associated with an overall increase in support for governance-related shareholder proposals. While these proposals are non-binding, they potentially increase pressure on boards to make changes to firms' governance. On average, a one percentage point increase in ownership by passive investors is associated with a 0.87–1.25 percentage point increase in support for governance proposals (Table 6, columns 4–6). While the increase in support is not statistically significant at conventional levels when adding second- or third-order polynomial controls (p -values 0.102 and 0.100, respectively), the implied magnitudes are economically large. Relative to the sample average, a 10 percent increase in ownership by passive investors is associated with a 9–13 percent increase in support for governance proposals. The lower statistical significance likely reflects the relatively small number of such proposals.

Finally, we consider whether ownership by passive investors is associated with differences in the type of shareholder proposals voted on. With the exception of proposals related to corporate social responsibility (CSR), we find little evidence that ownership by passive investors is associated with a difference in the composition of shareholder proposals. When using the wider bandwidth of 500, we find ownership by passive investors is associated with fewer CSR proposals and this difference is statistically significant – that is, the greater is the percentage passive institutional holdings, the lower is the number of shareholder-initiated CSR proposals (Appendix Table 5, columns 4-6). In particular, a one standard deviation increase in ownership by passive investors is associated with a 0.84 to 1.26 standard deviation decline in the number of CSR proposals. Thus, our results suggest that passive institutions have little influence on the types of shareholder proposals, except possibly CSR proposals.²⁶

Overall, our findings support the possibility that the voice of passive investors has a significant impact on corporate governance of firms. We find evidence of differences in governance outcomes directly related to votes, such as the share of independent directors and support for management and governance proposals. Our findings are also consistent with managers responding to the governance views expressed by passive investors, even on issues not necessarily subject to a shareholder vote, such as poison pill removals. Anecdotal evidence suggests that informal discussions between passive institutions and managers, backed up with the threat of voice, are often used to exert influence.²⁷

²⁶ Arguments can be made both for socially-responsible corporate activities (“doing well by doing good”) and against (inconsistent with shareholder wealth maximization). See Margolis, Elfenbien, and Walsh (2009) for a summary of this debate and the related evidence.

²⁷ Glenn Booraem, controller of Vanguard funds, notes that engagement with directors and management of companies is a key component of Vanguard’s governance program, and that Vanguard has “found through hundreds of discussion every year” that it is “frequently able to accomplish as much—or more—through dialogue” as through voting (see Booream (2013)).

B. Increased activism by others

Another possible mechanism by which passive ownership might influence firms' governance structure is by facilitating activism by others. In particular, the size and concentration of passive investors' ownership stakes may increase activist investors' ability to rally support for their demands (Brav et al. (2008)). Bringing just a few of these large investors on board can lend credibility to an activist campaign, and activists are known to gauge the support of firms' largest passive institutional investors before pursuing demands from management. Such added pressure from activist investors might also explain a number of the governance differences we observe.

We find no evidence, however, that greater ownership by passive investors is associated with more hedge fund activism; if anything, we find suggestive evidence of *less* hedge fund activism among firms with greater ownership by passive investors. To determine the influence of passive institutions on hedge fund activism, we estimate equation (1) with an indicator variable equal to one if the firm experiences a hedge fund activism event, as defined in Brav, Jiang, Partnoy, and Thomas (2008) and Brav, Jiang, and Kim (2010), and zero otherwise.²⁸ These estimates are reported in Table 7. The point estimates are always negative, and while not statistically significant at conventional levels, the estimates are economically large. In the 250 bandwidth (Table 7, columns 4-6), we find that a 1 percentage point increase in quasi-index ownership is associated with at 0.26 to 0.44 percentage point decline in the likelihood of hedge fund activism (p -values = 0.11, 0.11, and 0.12 when including polynomial controls of order $N = 1, 2,$ and $3,$ respectively). This magnitude is large given that a firm's likelihood of an activism event in a given year in our sample is, on average, only 1.3%.

The absence of increased activism, however, does not negate the possibility that the concentration of passive investors' ownership stakes facilitates hedge fund activism. Concerned about such activism, managers may be taking actions, such as nominating more independent directors, removing antitakeover defenses, or tailoring corporate policies, such as reducing cash holdings and increasing dividends, so as to preempt an actual activist campaign. Such preemptive actions could explain a decline in the number of actual activism events. To further explore this possibility, we next analyze whether ownership by passive investors is associated with differences in corporate policies.

²⁸ We thank Alon Brav for making these data on hedge fund activism events available to us. The database is an updated sample [1994-2011] using the same data collection procedure and estimation methods as in Brav, Jiang, Partnoy, and Thomas (2008) and Brav, Jiang, and Kim (2010). For more information on how the database is constructed, please see https://faculty.fuqua.duke.edu/~brav/HFactivism_SEPTEMBER_2013.pdf.

VI. Do passive investors affect corporate policies or firm performance?

Ownership by passive investors might also be associated with differences in corporate policies or firm performance. Such differences might occur if the observed differences in governance associated with passive investors affect managers' choices or if managers adjust corporate policies so as to preempt hedge fund activism campaigns that rely on the support of passive investors. To explore this possibility, we first analyze whether ownership by passive investors is associated with reduced cash holdings and increased dividends, which are two corporate policies that might preempt activism. Next, we analyze the composition and level of CEO pay, which is an area of corporate policy that some passive investors express views about. Finally, we explore the possible connections to firms' performance, investment, and financial policies studied in previous work on total institutional ownership and corporate policies.

A. Cash holdings and dividend policy

There is an extensive literature addressing the relation between corporate ownership structure and payout policy; for example, agency theories suggest that better monitoring by shareholders might lead to lower cash levels and higher payouts in the form of dividends (Jensen (1986), La Porta et al. (2000)). To examine whether ownership by passive investors is associated with differences in cash and dividends, we estimate equation (1) with the log of cash holdings in year t and the ratio of common dividends paid during year t to market value of equity at the end of year t . The results are reported in Table 8.²⁹

Consistent with either improved governance or managers attempting to preempt activism, we find evidence of both a decrease in cash holdings and an increase in the dividend yield. The estimated coefficient on $\text{Ln}(\text{Cash})$ is negative and statistically significant (Table 8, columns 1-3). The implied magnitudes are large; relative to the sample average, a 10 percent increase in *Quasi-index* is associated with about an 8 percent decline in cash holdings. The decline in cash holdings corresponds with an increase in dividend payouts. The estimated coefficient on *Dividend yield* is positive in all three estimations and significant (at the 10% level) when using a first- or second-order control for $\text{Ln}(\text{Mktcap})$ (columns 4–5). Relative to the sample average, a 10 percent increase in *Quasi-index* is associated with about a 2 percent increase in firms' dividend yield.³⁰

²⁹ Again, for brevity, we only report estimates when using the smaller bandwidth of 250 firms on each side of the divide between indexes. Findings are qualitatively similar when using the larger bandwidth of 500 firms.

³⁰ The findings are qualitatively similar if we instead use a payout ratio and scale firms' annual dividends by their net income. On average, a one standard deviation increase in *Quasi-index* is associated with a quarter of a standard deviation increase in firms' payout ratio, though the estimates are not statistically significant at conventional levels (p -values of 0.16, 0.15, and 0.35 when using polynomial controls of order $N = 1, 2,$ and $3,$ respectively).

B. Executive compensation

The next managerial decision we examine is CEO compensation. There has been much debate regarding managerial pay and whether its growth reflects an efficient market outcome or an agency conflict. It is unclear, however, whether or how passive investors might weigh into this debate regarding compensation. To assess whether passive ownership affects CEO compensation structure, we examine total CEO pay, its composition, and the sensitivity of CEO pay to stock price movements.

We find some evidence that an increase in ownership by passive investors is associated with a decline in overall managerial pay. When using the wider bandwidth of 500 firms, a one percentage point increase in *Quasi-index* is associated with a decline in total pay (Table 9, columns 1-3), and the estimate is statistically significant when using either a first- or second-order polynomial control for $\text{Ln}(Mktcap)$. However, the point estimates tend to decrease and are not statistically significant when using the 250-stock bandwidth (columns 4-6). In unreported analysis, we find no evidence that passive ownership is associated with differences in the composition of managerial pay (salary, bonuses, and grants of restricted stock, each scaled by total pay) or the sensitivity of total CEO pay to stock price movements (as measured using the delta or vega of the manager's stock portfolio; see Gormley, Matsa, and Milbourn (2013) for variable definitions). Thus, for our sample at least, passive institutions appear to have a relative small impact on decisions regarding executive compensation. However, it is important to note that our sample predates the implementation of "Say on Pay" by the Dodd-Frank Act in 2010. This provision, which requires nonbinding votes on executive pay packages, potentially provides an added mechanism for passive investors to influence compensation decisions.³¹

C. Overall performance and financing and investment decisions

While prior research finds an association between firms' index assignment, overall performance, and financing and investment decisions (e.g., Crane, Michenaud, Weston (2014), Mullins (2014)), we find little evidence that ownership by passive investors is related to overall performance or corporate

³¹ These findings might also support anecdotal evidence that passive investors focus more attention on overall governance of the firm than on issues related to managerial pay. For example, while Vanguard provides clear guidance on how it views specific governance-related votes, such as those related to independent directors and board declassification, it is more deferent to managers and directors regarding issues of pay. For example, Vanguard states, "While we do not want to determine the policies of the companies in which we invest—that is appropriately left to their boards and management, we believe that the following principles are critical in linking compensation and shareowner value." See <https://about.vanguard.com/vanguard-proxy-voting/executive-compensation/>.

policies related to investment or capital structure.³² We report these results in Appendix Tables 6 and 7. We find little evidence that passive ownership is associated with significant differences in firms' overall return on assets (ROA) or firm value, as measured using the log of Tobin's Q (Appendix Table 6). We do find some evidence of fewer equity issuances in the wider bandwidth of 500 firms, but this does not appear to translate into a significant difference in firms' overall leverage (Appendix Table 7). The estimated coefficient on *Leverage* is insignificant and economically small; for example, a one standard deviation increase in *Quasi-index* is associated with only a 0.10 standard deviation increase in leverage. In unreported results, we also find little evidence of a difference in firms' debt issuances, capital expenditures, R&D expenses, or acquisitions. These findings are consistent with anecdotal evidence that given their large, diversified holdings, passive investors lack the resources necessary to research and influence corporate policies that are inherently more firm-specific.³³

The difference in our findings with respect to recent studies that make use of the Russell 1000/2000 cutoff also highlights the importance of our specification choice. We now turn to describing the robustness of our findings and how our specification differs from these papers.

VII. Choice of specification and additional robustness checks

In this section, we discuss why using a regression discontinuity estimation in this setting is inappropriate and can yield misleading inferences. We also discuss the robustness of our IV estimates. In particular, we demonstrate that our findings are not sensitive to how we measure end-of-May market caps, to adding additional controls, or to instead using a more narrow definition of passive institutional ownership as our key explanatory variable.

A. Why we do not use regression discontinuity estimation

A seemingly attractive alternative approach to estimating the effect of passive investors in our setting would be to make use of regression discontinuity estimation. This approach would make use of the

³² Crane, Michenaud, Weston (2014) analyzes the impact of total institutional ownership on payout policy, voting, and other corporate outcomes like ROA and R&D, while Mullins (2014) studies CEO pay, CEO turnover, and other corporate outcomes, like capital expenditures and acquisitions. In contrast to these papers, we analyze ownership by *passive investors*, the governance outcomes explicitly mentioned by passive investors as being important, and potential mechanism by which passive investors might influence firms' governance choices.

³³ Another important and interesting question is whether any of the individual differences in governance we document affect firm performance or corporate policies. However, our empirical setting is not suited to answering this question. While our empirical setting provides variation in passive ownership across firms, allowing us to identify the effect of passive ownership on firms' governance structure and corporate policies, it does not provide exogenous variation in each individual governance outcome. Because of this, it is not possible to disentangle and separately identify the effect of each governance difference we document.

discontinuity in ownership by passive investors imposed between the 1000th and 1001st largest firms at the end of May each year to identify their effect on corporate outcomes. An advantage of this approach would be the ability to focus on a subset of firms very close to cutoff, thus reducing concerns that the estimation is not adequately controlling for the one variable that determines index assignment—the end-of-May market caps calculated by Russell—or other possible differences among firms that might be correlated with a firm’s index assignment even after conditioning on market capitalization and other controls.

If the variable used to determine index assignment, end-of-May market capitalization, was perfectly observable, then researchers interested in determining the effect of the being assigned to the Russell 2000 could estimate the following sharp regression discontinuity estimation:

$$Y_{it} = \alpha + \gamma R2000_{it} + \sum_{n=1}^N \phi_n (Rank_{it} - 1000)^n + \varepsilon_{it} \quad (3)$$

where Y is the outcome of interest for firm i in year t , $Rank$ is the ranking of firm i in year t in terms of end-of-May market capitalization (e.g., the 995th largest firm would have a rank of 995), and $R2000$ is, as in the specification above, an indicator that equals one for firms assigned to the Russell 2000. The sample could then be restricted to firms very close to the cutoff threshold of $Rank = 1000$, and the polynomial order of controls, N , could also be varied.³⁴ The above estimation of γ would identify the effect of being assigned to Russell 2000 on outcome Y by testing for a discontinuity in Y between the 1000th and 1001st largest firms, as determined using end-of-May market capitalization.

It is not possible to estimate the above equation, however, since the market capitalization used by Russell to determine firms’ index assignment at the end of May is not observable to the econometrician. Specifically, Russell calculates firms’ market capitalization using a proprietary calculation that does not perfectly match up to market capitalizations reported elsewhere, such as in CRSP, and because of this, econometricians can only imperfectly predict firms’ index assignments.³⁵ Interestingly, even when using Russell’s proprietary market capitalization (as used in Mullins (2014)), it is not possible to perfectly predict index inclusion. This is demonstrated by the top panel of Figure 4, in which the average

³⁴ One could also add an additional set of controls, $R2000_{it} \times \sum_{n=1}^N (Rank_{it} - 1000)^n$, to allow the functional form of the relation between $Rank$ and outcome Y to vary above and below the cutoff. See Angrist and Pischke (2009), Lee and Lemieux (2010), and Roberts and Whited (2013) for more details regarding regression discontinuity estimations.

³⁵ According to Russell’s documentation, this calculation of market capitalization includes some ownership stakes, like common stock, non-restricted exchangeable shares, and partnership units, but excludes other forms of shares, such as preferred stock or redeemable shares (Russell 2013). The share price chosen by Russell to compute market capitalization can also vary for firms that have multiple share classes or did not trade on the last day of May.

probability of treatment is plotted against rankings, as determined using Russell-provided market capitalizations; specifically, we plot the average fraction of firms in the Russell 2000 by size ranking using bins of 5 rankings each for the 950th to 1050th largest firms.³⁶

Some have proposed switching to a fuzzy regression discontinuity to overcome this problem (see e.g., Mullins (2014)). In particular, fuzzy regression estimation could be achieved by estimating Equation (3) and using *Treatment* as an instrument for *R2000*, where *Treatment* is an indicator that equals one for firms with a *Rank* greater than 1000, where *Rank* is determined using end-of-May market capitalizations.

Estimating a fuzzy regression discontinuity in this setting, however, is problematic because the end-of-May market capitalizations, even those provided by Russell, are a weak predictor of index assignment near the cutoff. As can be seen in the top panel of Figure 4, having a ranking above or below 1000 is a poor predictor of being in the Russell 2000 for firms near threshold between the 1000th and 1001st largest firms. In fact, firms with a ranking of 995-1000 are equally likely to be in the Russell 2000 as firms ranked 1001-1005. While the predictive power of end-of-May market caps is better further from this threshold, this is not helpful in that fuzzy regression discontinuity estimations rely on a discontinuity in probability of treatment *at the threshold*, not at points further away from the threshold (Angrist and Pischke (2009), Lee and Lemieux (2010), Roberts and Whited (2013)). Absent such a discontinuity, the estimation will suffer from a weak instrument problem.

The weakness of using fuzzy regression discontinuity estimation in this setting can be further seen in a graph of average quasi-index ownership by firms' ranking in the vicinity of the threshold. This is shown in the bottom panel of Figure 4, which provides a graphical representation of the reduced form version of the fuzzy regression discontinuity estimation. As shown in Figure 4, there is no meaningful jump in passive investors close to the 1000/2000 threshold using this approach. The reason is that each missed index assignment is introducing considerable noise in the fuzzy RD estimation. For example, every firm ranked between 950 and 1000 that is actually in the Russell 2000 will likely be at the top of their index (and hence receive a large jump in ownership by passive investors), while every firm ranked between 1001 and 1050 that is actually in the Russell 1000 will likely be at the bottom of their index. This correlation in the structure of noise near the threshold can also cause a fuzzy RD estimation to yield

³⁶ Similar to Mullins (2014), we contacted Russell Investments and were able to obtain their proprietary measure of market capitalizations for the years 2002 through 2006. Russell does not have the data prior to 2002. However, as noted by Mullins (2014) and shown in Figure 4, even these market caps are only a noisy measure of the true end-of-May market caps used by Russell to determine firms' index assignment. See Mullins (2014) for more details regarding the likely sources for this noise.

estimates that are the opposite of the true effect, thus potentially explaining why Mullins (2014) finds a counterintuitive *decrease* in institutional ownership for firms at the top of the Russell 2000.³⁷

Using the actual rankings assigned by Russell in a regression discontinuity framework, as done in Crane, Michenaud, and Weston (2014) and Lu (2013) will also be problematic. If actual Russell-assigned rankings, rather than end-of-May market cap rankings, are instead used to calculate the forcing variable, *Rank*, then other variables will no longer be continuous at the threshold. In particular, there will be a discontinuity in firms' float-adjusted market cap since Russell resorts firms within each index based on their float-adjusted market cap after index assignments are made; firms at the bottom of the Russell 1000 will have a smaller float-adjusted market cap than firms at the top of the Russell 2000. This is seen in the top half of Figure 5, where we plot the average Ln(float-adjusted market cap) by firms' Russell-assigned ranking. On average, the firm with a Russell-assigned ranking of 1000 (i.e., the bottom firm in the Russell 1000) has a float-adjusted market cap that is more than two log points smaller than the firm with a Russell-assigned ranking of 1001 (i.e., the top firm in the Russell 2000).

The discontinuity in float-adjusted market cap between the 1000th and 1001st ranking indicate that it is improper to use fuzzy regression discontinuity estimation with Russell-assigned rankings as the underlying forcing variable. Identification in fuzzy regression discontinuity estimation relies on the assumption that there is no discontinuity in other explanatory variables besides probability of treatment at the threshold (Angrist and Pischke (2009), Lee and Lemieux (2010), Roberts and Whited (2013)), which is clearly violated when using this alternative RD approach.³⁸

B. Robustness to choice of controls

The assumption of our identification strategy is that after limiting the sample to stocks close to the threshold and controlling for the one factor that determines index membership (i.e., end-of-May

³⁷ See the appendix of Crane, Michenaud, and Weston (2014) for more details. Chang, Hong, and Liskovich (2014) also use a fuzzy regression discontinuity in this setting to analyze the price effects of additions and deletions from a market index, but their RD estimation is considerably different. Because they are interested in the immediate price effects of firms that switch indexes, their fuzzy regression discontinuity makes use of stocks that move from one index to the other each year. Limiting the analysis to such movers does not make sense in our setting because many of the governance and corporate outcomes we study are unlikely to respond immediately to such moves or when such moves are transitory (i.e., the stock switches back the following year).

³⁸ Using May 31st CRSP market capitalization to determine rankings (within the actual assigned index), as done in a robustness check by Crane, Michenaud, and Weston (2014), will be problematic for a similar reason. Because firms are resorted within an index using total end-of-May CRSP market caps in this alternative approach, there will now exist a discontinuity in Ln(*Mktcap*) near the threshold. The firm with the smallest end-of-May CRSP *Mktcap* within the Russell 1000 will be assigned a rank of 1000, while the firm with the largest end-of-May CRSP *Mktcap* within the Russell 2000 will be assigned a rank of 1001. This discontinuity occurs because the CRSP market caps are only a noisy predictor of the true, but unobserved, forcing variable. This is shown in Appendix Figure 2.

market cap), index membership does not directly affect our outcomes of interest except through its effect on ownership by passive investors. This is the exclusion restriction of the IV estimation. However, because Russell Investments uses a proprietary method to calculate firms' total market caps, we are only able to imperfectly control for the underlying market cap used to determine index assignment.

Our findings, however, are robust to using alternative ways to measure firms' end-of-May market cap. In particular, using the noisy end-of-May market caps obtained directly from Russell to instead measure *Mktcap* does not affect our findings.³⁹ This is shown in Appendix Table 8, where we re-estimate our main IV regressions for the period 1998-2006 using the 250 bandwidth with second-order polynomial controls for $\text{Ln}(Mktcap)$ after replacing the CRSP market cap with the Russell-provided market cap for the years 2002-2006. The estimates are nearly the same as before; in particular, we still find a strong association between higher ownership by passive investors and more independent directors, fewer restrictions on special meetings, fewer dual class share structures, less support for managerial proposals, less cash, and greater payouts. In fact, the drop in hedge fund activism becomes statistically significant at the 10% confidence level when using Russell, rather than CRSP, to calculate end-of-May market capitalization. Our findings are also robust to instead using the Compustat security monthly file to determine end-of-May market cap. These findings are reported in Appendix Table 9.

Our findings are also robust to controlling for firms' industry or to controlling for whether a firm switched indexes that year. If we add 2-digit SIC industry fixed effects to the specification, we still find that passive ownership is associated with more independent directors, more poison pill removals, fewer restrictions on special meetings, fewer dual class share structures, and less support for managerial proposals. These findings are reported in Appendix Table 10. Our findings are also largely unaffected if we add two additional controls to account for firms that moved from the Russell 1000 to the Russell 2000 that year, and vice versa. These findings are reported in Appendix Table 11. If such switchers differ in other dimensions and represent a disproportionate share of either index, this could affect our earlier estimates. However, with the exception of the dividend yield, all of the findings are robust to the inclusion of these controls, and the negative association between passive ownership and hedge fund activism now becomes statistically significant at the 5 percent level.

³⁹ We choose to use the CRSP market caps for our main analysis so as to ensure a consistent measure of market cap across sample years.

Overall, our findings are not sensitive to how we measure firms' end-of-May market cap, to the order of polynomials we use to control for $\text{Ln}(\text{Mktcap})$, our choice of bandwidth, and the inclusion of additional controls, thus providing confidence that our estimation strategy is not affected by our inability to perfectly measure the end-of-May market cap used to determine index membership or to differences in composition of firms or industries across the two indexes.

C. Robustness to alternative definitions of passive ownership

For our main analysis, we measure the ownership stake of passive investors by summing up the ownership of institutions classified as quasi-indexers by Bushee (2001). Bushee defines quasi-indexers as institutions with low turnover and highly diversified portfolios, and this categorization likely captures most passive institutions. Consistent with this, we find that three of the largest institutions most commonly associated with passive investing, Barclays Bank (which owned iShares during our sample period), State Street, and Vanguard, are classified as quasi-indexers.

Our findings are also robust to using a narrower definition of passive investors. In particular, if we instead measure passive ownership as just the sum of holdings by Barclays Bank, State Street, and Vanguard, we get similar findings. In unreported first stage estimates, we find that being assigned to the Russell 2000 is associated with a very large and statistically significant increase in the combined holdings of these three passive institutions; they account for about half of the 2-4 percentage point increase in *Quasi-index* ownership shown in Table 3. Moreover, our IV estimations become larger and more statistically significant when we use the combined ownership of these three firms as the explanatory variable instead of all quasi-index ownership. This can be seen in Appendix Table 12. These findings provide additional confidence that our earlier estimates are capturing the influence of passive investors.⁴⁰

VIII. Conclusion

While there is a large literature that studies the important governance role of active investors, like hedge funds and pension funds, there is surprisingly little analysis of passive institutions like Vanguard, State Street, and DFA, which represent an increasingly important component of U.S. stock ownership.

⁴⁰ For our main analysis, however, we prefer to use the broader classification of passive investors that includes all institutions classified as quasi-indexers. Because some passive investors are excluded in the narrower definition, the *R2000* instrumental variable may also be affecting the outcomes of interest through its effect on the ownership stake of other passive investors. Our results are also qualitatively similar when using total institutional ownership (rather than quasi-index ownership) as the main explanatory variable.

This lack of focus on passive institutional investors likely stems from a common presumption that passive investors are passive owners that lack both the motives and resources to monitor their large and diverse portfolios. Yet, there are multiple reasons why the governance views of passive investors might also play an important role in affecting firms' policy choices and overall governance structure. For example, the size and concentration of their ownership stake can have a significant influence on the outcome of shareholder votes and increase the threat of activism by facilitating activist investors' ability to rally support for their demands. Passive institutional investors may also be more effective at monitoring managers than retail investors that directly hold stocks, and at ensuring compliance with what they consider to be an effective governance structure for the average firm.

In this paper we examine whether passive institutions affect firms' governance, and if so, by which mechanisms, by exploiting variation in passive institutional ownership that occurs around the cutoff used to construct the Russell 1000 and Russell 2000 indexes. Because the smallest stocks at the bottom of the Russell 1000 have very small weights in their index while the largest stocks at the top of the Russell 2000 have weights within their index that are an order of magnitude larger, benchmarking to these indexes leads to a jump in ownership by passive institutions for stocks at the top of the Russell 2000 relative to stocks at the bottom of the Russell 1000. Thus, we instrument passive institutional ownership with an indicator for being assigned to the Russell 2000 in a given year. Our instrumental variable estimation relies on the assumption that after conditioning on firms' market capitalization, which determines index assignment, inclusion in the Russell 2000 index does not directly affect our governance or corporate outcomes except through its impact on ownership by passive investors.

Our findings suggest that while passive institutional investors are not "active" in the traditional sense of accumulating or selling shares in a target company with the express purpose of influencing management, they are not entirely "passive" either. In particular, we find that ownership by passive institutions is associated with more independent directors on a board, more poison pill removals, the elimination of restrictions on shareholders' ability to call special meetings, and fewer dual class share structures. These differences in governance structure conform to the governance views and voting guidelines of the largest passive institutional investors and are also associated with differences in corporate policies. In particular, while we find no overall difference in firm performance or value, ownership by passive institutions is associated with a decrease in firms' cash holdings, an increase in dividends, and a suggestive decline in managerial compensation.

Our findings suggest that a key mechanism by which passive investors' influence firms' governance is through their large voting blocs and strong views on what constitutes effective governance for the average firm. Rather than engage in costly, firm-specific interventions for each stock in their large, diversified portfolios, passive investors seem to exert influence by voting (or withholding management support) according to general voting guidelines regarding basic aspects of governance. Consistent with this potential mechanism, we find that higher passive institutional ownership is associated with less support for management proposals and a greater support for shareholder-initiated governance proposals. The observed differences in actual governance structures suggests that passive institutions may be more attentive than the retail investors they displace regarding firms' governance structures and that increases in passive institutional ownership increases their ability to exert influence. We do not find direct evidence that ownership by passive investors increases activism by other investors, like hedge funds, though we cannot exclude the possibility that the observed differences in governance and corporate policies are driven by an increased threat of activism by others. Overall, our findings shed new light on the importance of passive investors and their rapid growth over the last few decades.

IX. Appendix – Excerpts from Fund Governance/Voting Policies

In this appendix, we provide excerpts regarding the voting policies of various institutional investors that offer index-related investment products. A common theme of these governance/voting policies is (1) to either withhold support or vote against boards that are not sufficiently independent, and (2) broadly oppose takeover defenses, like poison pills, restrictions on shareholders' ability to call a special meeting, dual class shares, and classified boards. Some institutions also provide guidance regarding their views related to equity issuances, executive pay, and corporate social responsibility initiatives, which we also provide some excerpts of here.

A. Blackrock: Proxy Voting Guidelines for U.S. Securities⁴¹

- We expect that a board should be majority independent. We believe that an independent board faces fewer conflicts and is best prepared to protect shareholder interests.
- Where a poison pill is put to a shareholder vote, our policy is to examine these plans individually. Although we oppose most plans, we may support plans that include a reasonable 'qualifying offer clause.' Such clauses typically require shareholder ratification of the pill, and stipulate a sunset provision whereby the pill expires unless it is renewed.
- We believe that classification of the board dilutes shareholders' right to evaluate promptly a board's performance and limits shareholder selection of their representatives. By not having the mechanism to immediately address concerns we may have with any specific director, we may be required to register our concerns through our vote on the directors who are subject to election that year. Furthermore, where boards are classified, director entrenchment is more likely, because review of board service generally only occurs every three years. Therefore, we typically vote against classification and for proposals to eliminate board classification.
- In exceptional circumstances and with sufficiently broad support, shareholders should have the opportunity to raise issues of substantial importance without having to wait for management to schedule a meeting. We therefore believe that shareholders should have the right to call a special meeting in cases where a reasonably high proportion of shareholders (typically a minimum of 15% but no higher than 25%) are required to agree to such a meeting before it is called.
- BlackRock supports the concept of equal voting rights for all shareholders. Some management proposals request authorization to allow a class of common stock to have superior voting rights over the existing common or to allow a class of common to elect a majority of the board. We oppose such differential voting power as it may have the effect

⁴¹ <http://www.blackrock.com/corporate/en-us/literature/fact-sheet/blk-responsible-investment-guidelines-us.pdf>

of denying shareholders the opportunity to vote on matters of critical economic importance to them.

*B. Dimensional Fund Advisors: Prospectus (Statement of Additional Information)*⁴²

- Vote AGAINST or WITHHOLD from Inside Directors and Affiliated Outside directors when:
 - Independent directors make up less than a majority of directors.
- Vote AGAINST or WITHHOLD from the entire board of directors (except new nominees, who should be considered CASE-BY-CASE) for the following:
 - The board adopts a poison pill with a term of more than 12 months (“long-term pill”), or renews any existing pill, including any “short-term” pill (12 months or less), without shareholder approval.
 - The board is classified, and a continuing director responsible for a problematic governance issue at the board/committee level that would warrant a withhold/against vote recommendation is not up for election. All appropriate nominees (except new) may be held accountable.
- Generally vote AGAINST proposals to create a new class of common stock unless:
 - The new class is not designed to preserve or increase the voting power of an insider or significant shareholder.
- Vote CASE-BY-CASE on all other proposals to increase the number of shares of common stock authorized for issuance. Take into account company-specific factors that include, at a minimum, the following:
 - The company's use of authorized shares during the last three years
 - The dilutive impact of the request as determined by an allowable increase calculated by ISS (typically 100 percent of existing authorized shares) that reflects the company's need for shares and total shareholder returns.

*C. State Street Global Advisors: Proxy Voting and Engagement Guidelines – US*⁴³

- In principle, SSgA believes independent directors are crucial to good corporate governance and help management establish sound corporate governance policies and practices. A sufficiently independent board will most effectively monitor management and perform oversight functions necessary to protect shareholder interests.

⁴² http://us.dimensionalfund.com/media/documents/downloads/pub/pdf/sai/idg_equity_i_sai.pdf

⁴³ http://www.ssga.com/library/capb/713689_Proxy_Voting_and_Engagement_Guidelines_US_1_CCRI1396595054.pdf

- SSgA will support mandates requiring shareholder approval of a shareholder rights plans (“poison pill”) and repeals of various anti-takeover related provisions. In general, SSgA will vote against the adoption or renewal of a US issuer’s shareholder rights plan (“poison pill”).

SSgA generally supports annual elections for the board of directors. In certain cases, SSgA will support a classified board structure; if the board is composed of 80 percent independent directors, the board’s key committees (auditing, nominating and compensation) are composed of independent directors, and consideration of other governance factors, including, but not limited to, shareholder rights and antitakeover devices.

- SSgA will vote for shareholder proposals related to special meetings at companies that give shareholders (with a minimum 10% ownership threshold) the right to call for a special meeting in their bylaws if:
 - The current ownership threshold to call for a special meeting is above 25% of outstanding shares.

SSgA will vote for management proposals related to special meetings.

- SSgA will not support proposals authorizing the creation of new classes of common stock with superior voting rights and will vote against new classes of preferred stock with unspecified voting, conversion, dividend distribution, and other rights. In addition, SSgA will not support capitalization changes that add “blank check” classes of stock (i.e. classes of stock with undefined voting rights) or classes that dilute the voting interests of existing shareholders.

However, SSgA will support capitalization changes that eliminate other classes of stock and/or unequal voting rights.

- SSgA considers numerous criteria when examining equity award proposals. Generally, SSgA does not vote against plans for lack of performance or vesting criteria ... There are numerous factors that we view as negative, and together, may result in a vote against a proposal.

D. Vanguard: Proxy Voting Guidelines⁴⁴

- Good governance starts with a majority-independent board, whose key committees are comprised entirely of independent directors. As such, companies should attest to the independence of directors who serve on the Compensation, Nominating, and Audit committees.
- A company's adoption of a so-called poison pill effectively limits a potential acquirer's ability to buy a controlling interest without the approval of the target's board of directors.

⁴⁴ <https://about.vanguard.com/vanguard-proxy-voting/voting-guidelines/>

Such a plan, in conjunction with other takeover defenses, may serve to entrench incumbent management and directors. However, in other cases, a poison pill may force a suitor to negotiate with the board and result in the payment of a higher acquisition premium. In general, shareholders should be afforded the opportunity to approve shareholder rights plans within a year of their adoption.

- The funds will generally support proposals to declassify existing boards (whether proposed by management or shareholders), and will block efforts by companies to adopt classified board structures in which only part of the board is elected each year.
- The funds support shareholders' right to call special meetings of the board (for good cause and with ample representation) and to act by written consent. The funds will generally vote for proposals to grant these rights to shareholders and against proposals to abridge them.
- We are opposed to dual-class capitalization structures that provide disparate voting rights to different groups of shareholders with similar economic investments. We will oppose the creation of separate classes with different voting rights and will support the dissolution of such classes.
- Bonus plans, which must be periodically submitted for shareholder approval to qualify for deductibility under Section 162(m) of the Internal Revenue Code, should have clearly defined performance criteria and maximum awards expressed in dollars. Bonus plans with awards that are excessive in both absolute terms and relative to a comparative group generally will not be supported.
- Often, proposals [related to corporate social policy] may address concerns with which the Board philosophically agrees, but absent a compelling economic impact on shareholder value (e.g., proposals to require expensing of stock options), the funds will typically abstain from voting on these proposals. This reflects the belief that regardless of our philosophical perspective on the issue, these decisions should be the province of company management unless they have a significant, tangible impact on the value of a fund's investment and management is not responsive to the matter.

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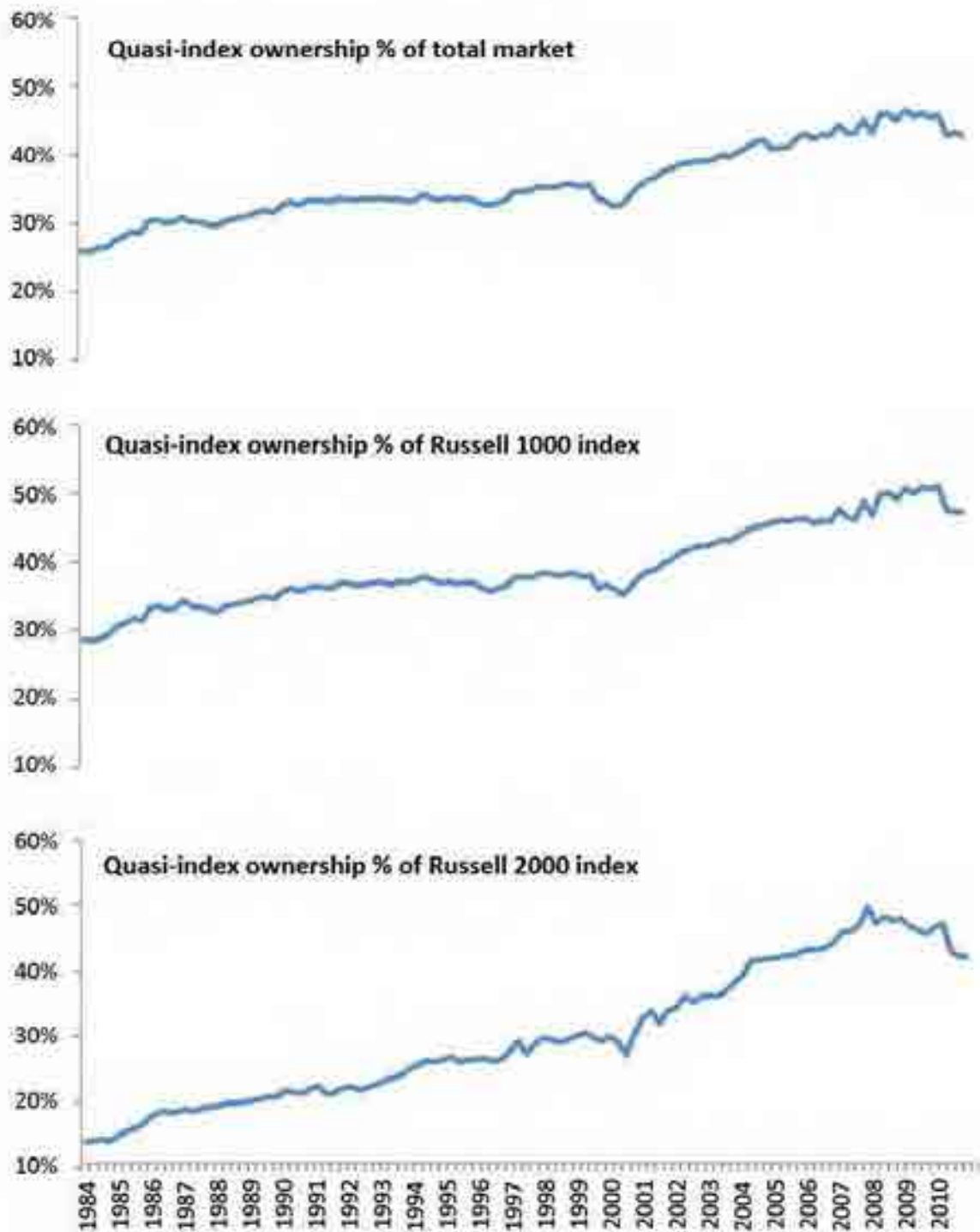


Figure 1

Growth of passive investors, 1984-2010

This figure plots the percent ownership stake of quasi-index institutional investors, as defined in Bushee (2001), between 1984 and 2010 for the total market, the Russell 1000 index, and the Russell 2000 index.

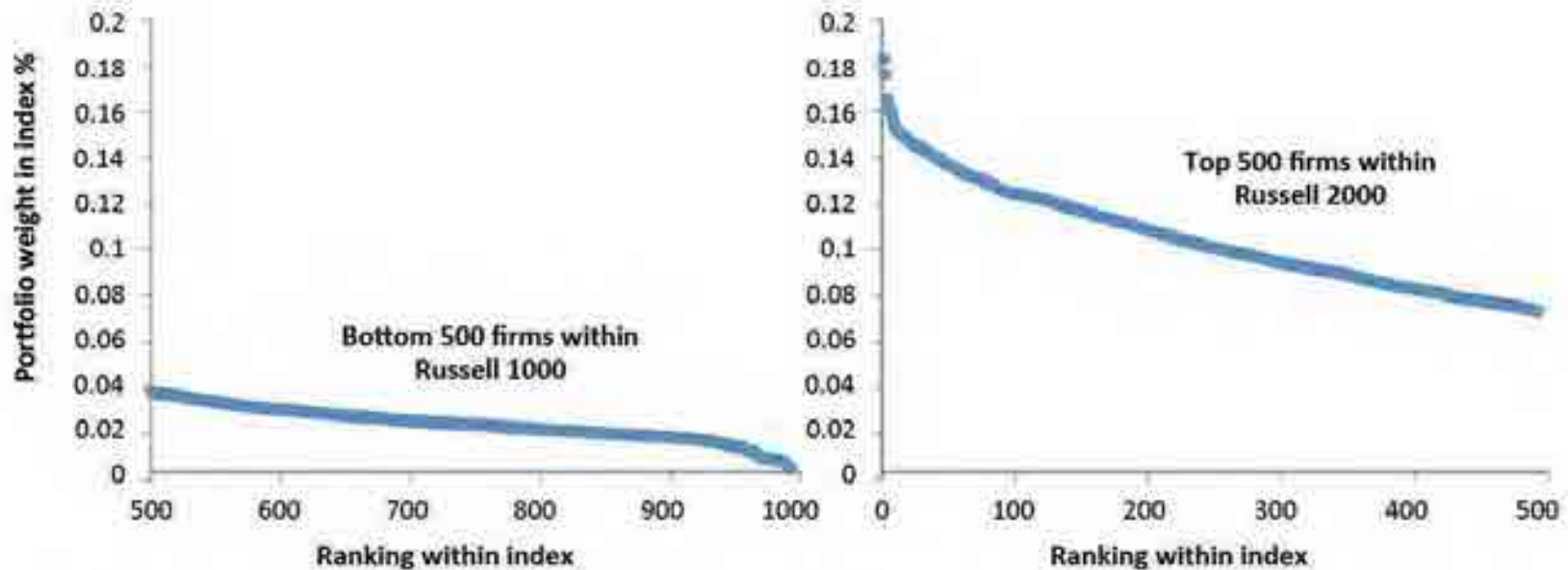


Figure 2

Portfolio weights in the Russell 1000 and 2000 indices by within-index ranking for the year 2006

This figure plots the portfolio weights of the bottom 500 firms in the Russell 1000 index and the top 500 firms in the Russell 2000 index for the year 2006. Observations are ordered by their within-index ranking such that rankings of 1 and 1000 represent the firms with the largest and 1000th largest portfolio weight in the index, respectively. The portfolio weights are given as a percent.

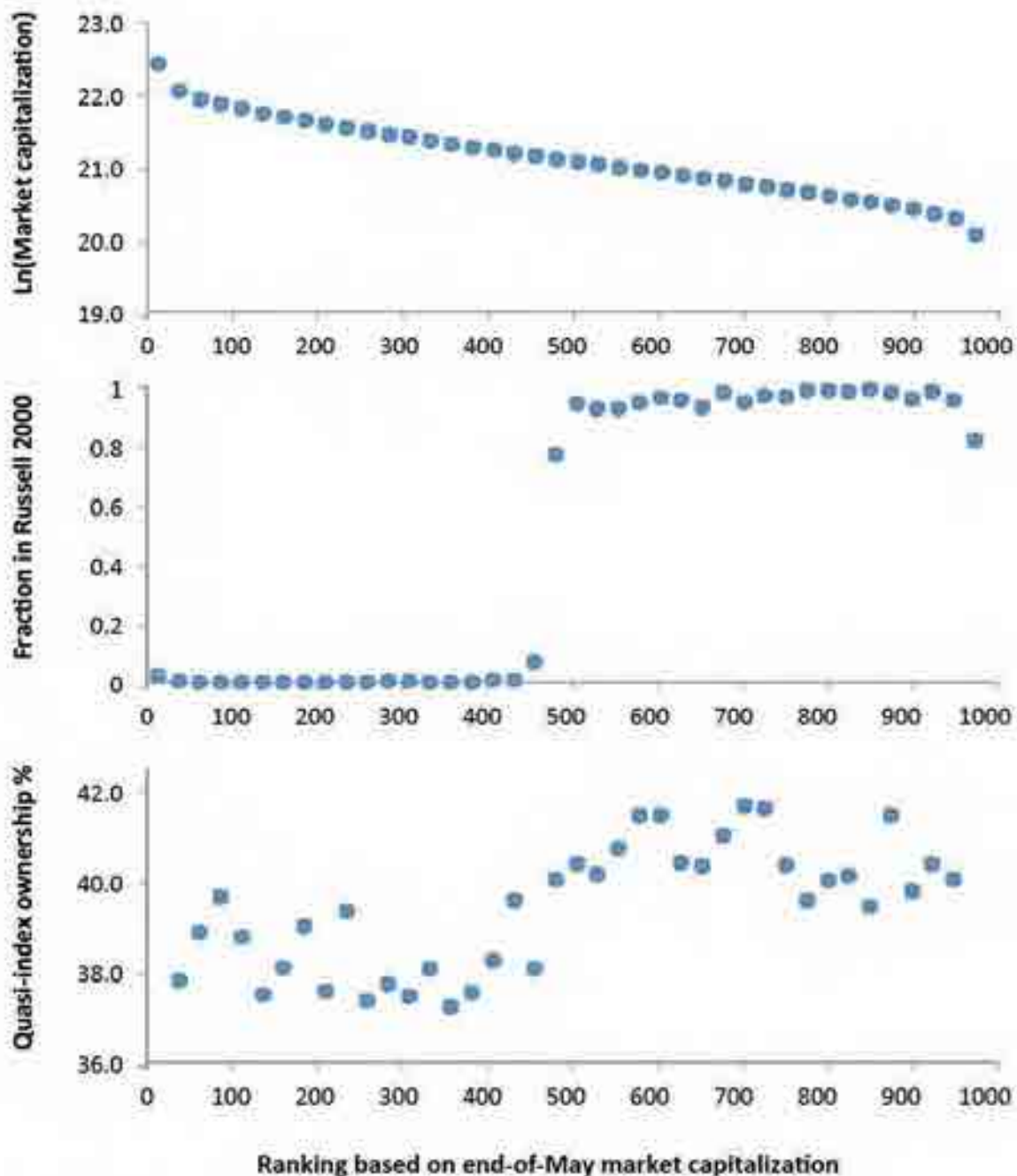


Figure 3
Market cap, index assignment, and quasi-index ownership by market cap rankings for the bottom 500 firms of Russell 1000 and top 500 firms of Russell 2000

This figure plots the average end-of-May Ln(market capitalization), fraction of firm-year observations in the Russell 2000, and quasi-index ownership (%) by ranking for the bottom 500 firms of the Russell 1000 and the top 500 firms of the Russell 2000, where ranking is determined using end-of-May market capitalization, as reported in CRSP. Averages are calculated using bins of 25 firms and data from 1998-2006.

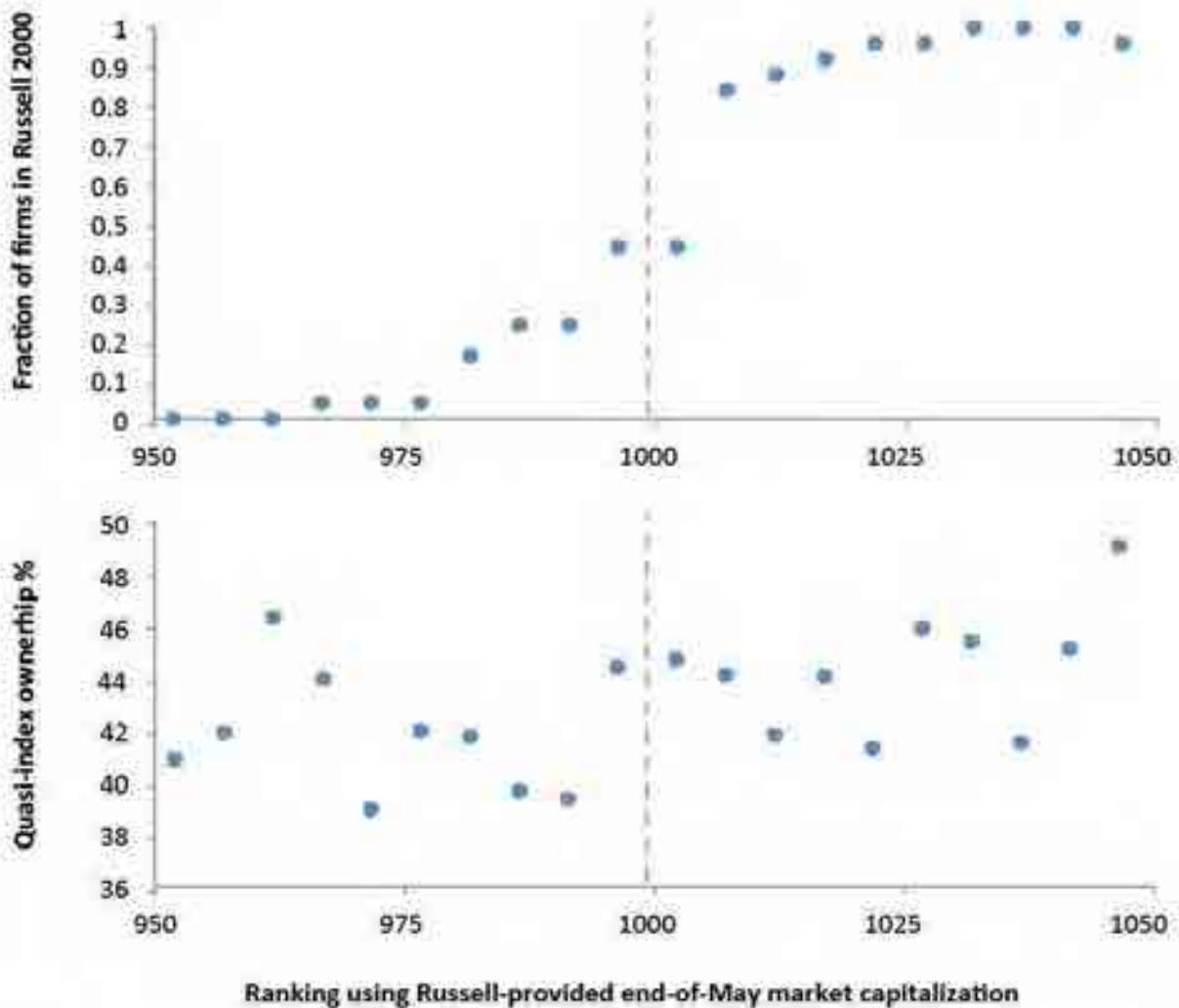


Figure 4
Probability of treatment and quasi-index ownership by ranking near the Russell 1000/2000 threshold using Russell-provided market capitalizations
 This figure plots the average fraction of firm-year observations in the Russell 2000 and percent quasi-index ownership by size ranking for the 950th to 1050th largest firms, where ranking is determined using end-of-May market capitalization numbers provided directly by Russell Investments for firms in the Russell 1000/2000 indices between 2002 and 2006. Averages are calculated using bins of five rankings and data from 2002-2006.

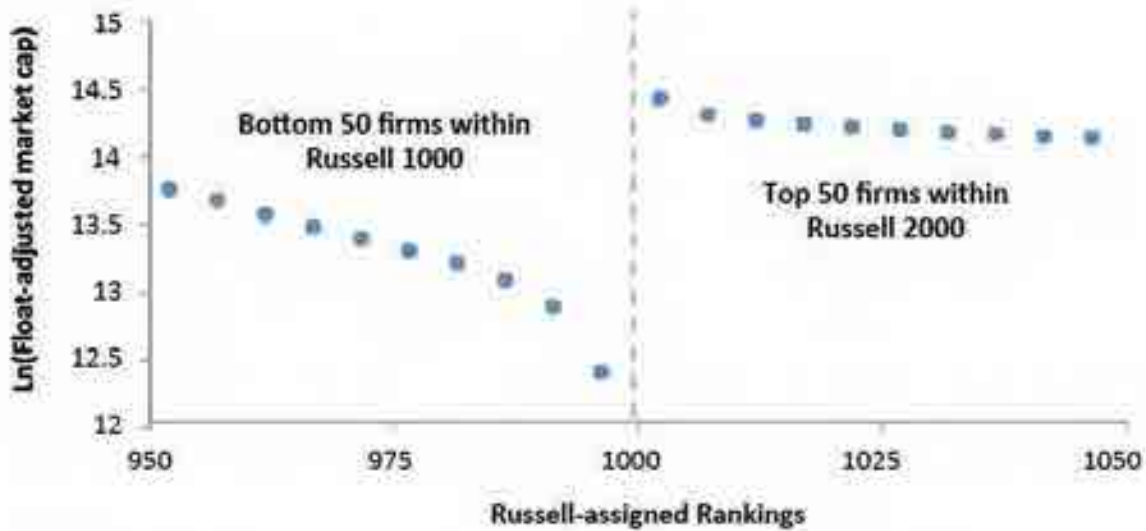


Figure 5
Average $\text{Ln}(\text{Float})$ by ranking, where ranking is calculated using float-adjusted portfolio weights assigned by Russell
 This figure plots the average $\text{Ln}(\text{float-adjusted market cap})$ by Russell-determined rankings for the bottom 50 firms in the Russell 1000 index and the top 50 firms in the Russell 2000 index for the years 1998-2006. A ranking of 1000 reflects the firm with the lowest portfolio weight in the Russell 1000 index, while a ranking of 1001 reflects the firm with the highest portfolio weight in the Russell 2000 index. Averages are calculated using bins of five rankings.

Table 1
Summary statistics

This table reports summary statistics for our key variables. Summary statistics are reported separately for our two samples: firms in the 250 and 500 bandwidths around the cutoff between the Russell 1000 and 2000 indexes. Definitions for all variables are provided in Appendix Table 1. Accounting variables are winsorized at the 1% level, and we delete observations where the ratio of institutional shares owned to shares outstanding is missing or greater than 1.

	500 bandwidth				250 bandwidth			
	Obs.	Mean	Median	SD	Obs.	Mean	Median	SD
<i>Institutional ownership %</i>	8,268	64.5	68.3	22.2	4,105	63.6	67.8	23.2
<i>Quasi-index %</i>	8,268	39.1	39.7	15.3	4,105	38.3	39.3	16.1
<i>Dedicated %</i>	8,268	9.2	7.15	9.1	4,105	9.2	6.9	9.7
<i>Transient %</i>	8,268	16.1	14.2	10.7	4,105	16.0	14.2	10.7
<i>Independent director %</i>	5,604	65.3	66.7	17.9	2,685	64.9	66.7	18.2
<i>Poison pill removal</i>	5,472	0.04	0	0.19	2,708	0.04	0	0.18
<i>Greater ability to call special meeting</i>	3,552	0.006	0	0.07	1,740	0.007	0	0.08
<i>Indicator for dual class shares</i>	3,552	0.12	0	0.32	1,740	0.12	0	0.33
<i>Mngt. proposal support %</i>	2,041	84.9	88.0	12.1	1,005	85.0	87.6	12.1
<i>Shareholder gov. proposal support %</i>	408	39.2	38.0	23.7	190	35.9	31.5	22.5
<i>Indicator for hedge fund activism</i>	8,268	0.014	0	0.12	4,105	0.014	0	0.12
<i># management proposals passed</i>	5,571	0.69	0	1.16	2,675	0.71	0	1.16
<i># CSR proposals</i>	5,124	0.06	0	0.23	2,419	0.05	0	0.22
<i>Ln(Cash)</i>	8,019	4.53	4.72	1.51	3,983	4.51	4.72	1.49
<i>Dividend yield</i>	8,011	0.149	0.003	0.03	3,976	0.144	0.002	0.03
<i>Ln(Total CEO pay)</i>	5,633	7.85	7.88	0.87	2,657	7.83	7.85	0.84

Table 2**First-stage estimation, impact of index assignment on institutional ownership**

This table reports estimates of our first-stage regression of institutional holdings on an indicator for membership in the Russell 2000 index plus additional controls. Specifically, we estimate

$$IO_{it} = \eta + \lambda R2000_{it} + \sum_{s=1}^S \chi_s (Ln(Mktcap_{it}))^s + \sigma Ln(Float)_{it} + \delta_t + u_{it}$$

where $R2000_{it}$ is a dummy variable equal to 1 if stock i is in the Russell 2000 Index at end of June in year t , $Mktcap_{it}$ is the CRSP market value of equity of stock i measured at May 31 in year t , $Float_{it}$ is the float-adjusted market value of equity (provided by Russell) at June 30 in year t , and δ_t are year fixed effects. IO_{it} measures institutional ownership for stock i at the end of September in year t . In this table we use four different definitions for IO for stock i : (1) the percentage of shares outstanding owned by all institutional investors (from 13F filings); (2) the percentage of shares outstanding owned by "quasi-indexers" as classified by Bushee (2001); (3) the percentage of shares outstanding owned by "dedicated" institutions as classified by Bushee; and (4) the percentage of shares outstanding owned by "transient" institutional as classified by Bushee. The Bushee classifications are defined in the text. The sample consists of the top 500 firms in the Russell 2000 index and bottom 500 firms of the Russell 1000 index (i.e., bandwidth = 500) for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable =</i>	Percent of firm's common shares held by:			
	All institutions	Quasi-index	Dedicated	Transient
	(1)	(2)	(3)	(4)
<i>R2000</i>	1.974* (1.068)	2.756*** (0.661)	-0.742 (0.609)	0.0126 (0.501)
Bandwidth	500	500	500	500
Polynomial order, N	3	3	3	3
Float control	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes
# of firms	2,318	2,318	2,318	2,318
Observations	8,268	8,268	8,268	8,268
R-squared	0.18	0.21	0.02	0.05

Table 3**Robustness of first stage estimation for quasi-index ownership**

This table reports estimates of our first-stage regression of Quasi-index ownership onto an indicator for membership in the Russell 2000 index plus additional controls. Specifically, we estimate

$$Quasi-index_{it} = \eta + \lambda R2000_{it} + \sum_{n=1}^N \chi_n (Ln(Mktcap_{it}))^n + \sigma Ln(Float)_{it} + \delta_t + \mu_{it}$$

where $R2000_{it}$ is a dummy variable equal to 1 if stock i is in the Russell 2000 Index at end of June in year t , $Mktcap_{it}$ is the CRSP market value of equity of stock i measured at May 31 in year t , $Float_{it}$ is the float-adjusted market value of equity (provided by Russell) at June 30 in year t , and δ_t are year fixed effects. $Quasi-index_{it}$ is the percentage of shares outstanding owned by Quasi-index institutions, as classified by Bushee (2001), for stock i at the end of September in year t . The Bushee classifications are defined in the text. The data consist of firms in the two Russell indexes for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period using bandwidths of 500 firms (columns 1-3) and 250 firms (columns 4-6) around the Russell 1000/2000 threshold, and polynomial order controls for $Ln(Mktcap)$ of $N = 1, 2,$ and 3 . *** indicates significance at the 1% level.

<i>Dependent variable =</i>	Quasi-index %					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>R2000</i>	3.820*** (0.637)	3.974*** (0.630)	2.756*** (0.661)	3.006*** (0.715)	2.999*** (0.701)	2.041*** (0.763)
Bandwidth	500	500	500	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	2,318	2,318	2,318	1,566	1,566	1,566
Observations	8,268	8,268	8,268	4,105	4,105	4,105
R-squared	0.20	0.20	0.21	0.25	0.25	0.25

Table 4**Ownership by passive investors and the percentage of independent directors**

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive investors on the percentage of independent board directors. Specifically, we estimate

$$Y_{it} = \alpha + \beta \text{Quasi-index}_{it} + \sum_{n=1}^N \theta_n (\text{Ln}(\text{Mktcap}_{it}))^n + \gamma \text{Ln}(\text{Float}_{it}) + \delta_i + \varepsilon_{it}$$

where Y_{it} is the percentage of independent directors on the board of firm i in year t (from Riskmetrics). Quasi-index_{it} is the percentage of shares outstanding owned by quasi-index institutions (as classified by Bushee (2001)) for stock i at the end of September in year t . Mktcap_{it} is the CRSP market value of equity of stock i measured at May 31 in year t , and Float_{it} is the float-adjusted market value of equity (provided by Russell) at June 30 in year t , and δ_i are year fixed effects. We instrument Quasi-index in the above estimation using $R2000_{it}$, an indicator equal to one if firm i is part of the Russell 2000 index in year t . The Bushee classifications are defined in the text. The data consist of firms in the two Russell indexes for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period using bandwidths of 500 firms (columns 1-3) and 250 firms (columns 4-6) around the Russell 1000/2000 threshold, and polynomial order controls for $\text{Ln}(\text{Mktcap})$ of $N = 1, 2,$ and 3 . Standard errors, ε , are clustered at the firm level. The symbols ** and *** indicate significance at the 5% and 1% levels, respectively.

<i>Dependent variable =</i>	Independent director %					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Quasi-index %</i>	0.885** (0.347)	0.941*** (0.360)	0.771** (0.381)	1.415*** (0.416)	1.579*** (0.459)	1.407*** (0.490)
Bandwidth	500	500	500	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	1,570	1,570	1,570	1,037	1,037	1,037
Observations	5,604	5,604	5,604	2,685	2,685	2,685

Table 5**Ownership by passive investors and takeover defenses**

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive investors on several takeover defense related outcomes. Specifically, we estimate

$$Y_{it} = \alpha + \beta \text{Quasi-index}_{it} + \sum_{s=1}^N \theta_s (\text{Ln}(\text{Mktcap}_{it}))^s + \gamma \text{Ln}(\text{Float}_{it}) + \delta_t + \varepsilon_{it}$$

where Y_{it} is the governance variable for firm i in year t , Quasi-index_{it} is the percentage of shares outstanding owned by quasi-index institutions (as classified by Bushee (2001)) for stock i at the end of September in year t , Mktcap_{it} is the CRSP market value of equity of stock i measured at May 31 in year t , and Float_{it} is the float-adjusted market value of equity (provided by Russell) at June 30 in year t , and δ_t are year fixed effects. The governance variables investigated in this table, from Shark Repellent (Factset) and Riskmetrics, are: an indicator for either the withdrawal or expiration (without renewal) of a poison pill in year t , an indicator for there being fewer restrictions on shareholders' ability to call a special meeting in year t , and an indicator that equals one if a firm has dual class shares in year t . We instrument Quasi-index in the above estimation using $R2000_{it}$, an indicator equal to one if firm i is part of the Russell 2000 index in year t . The Bushee classifications are defined in the text. The data consist of firms in the two Russell indexes for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period using a bandwidth of 250 firms around the Russell 1000/2000 threshold and first, second, and third polynomial order controls for $\text{Ln}(\text{Mktcap})$. Standard errors, ε , are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable =</i>	Poison pill removal			Greater ability to call special meeting			Indicator for dual class shares		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Quasi-index %</i>	0.005* (0.003)	0.006* (0.003)	0.011 (0.008)	0.005** (0.002)	0.005* (0.003)	0.006* (0.003)	-0.047** (0.019)	-0.064** (0.027)	-0.066** (0.031)
Bandwidth	250	250	250	250	250	250	250	250	250
Polynomial order, N	1	2	3	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	1,087	1,087	1,087	1,000	1,000	1,000	1,000	1,000	1,000
Observations	2,708	2,708	2,708	1,740	1,740	1,740	1,740	1,740	1,740

Table 6**Ownership by passive investors and shareholder support for proposals**

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive investors on shareholder support for management proposals and shareholder-initiated governance proposals. Specifically, we estimate

$$Y_{it} = \alpha + \beta \text{Quasi-index}_{it} + \sum_{n=1}^N \theta_n (\text{Ln}(\text{Mktcap}_{it}))^n + \gamma \text{Ln}(\text{Float})_{it} + \delta_i + \varepsilon_{it}$$

where Y_{it} is either the average percentage of shareholders that vote along with management proposals at annual meetings for i in year t (from Riskmetrics) or the average percentage of shareholders that vote in support of a shareholder-initiated governance proposal for firm i in year t (from Riskmetrics). Quasi-index_{it} is the percentage of shares outstanding owned by quasi-index institutions (as classified by Bushee (2001)) for stock i at the end of September in year t . Mktcap_{it} is the CRSP market value of equity of stock i measured at May 31 in year t , and Float_{it} is the float-adjusted market value of equity (provided by Russell) at June 30 in year t , and δ_i are year fixed effects. We instrument Quasi-index in the above estimation using $R2000_{it}$, an indicator equal to one if firm i is part of the Russell 2000 index in year t . The Bushee classifications are defined in the text. The data consist of firms in the two Russell indexes for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period using a bandwidth of 250 firms around the Russell 1000/2000 threshold, and polynomial order controls for $\text{Ln}(\text{Mktcap})$ of $N = 1, 2$, and 3. Standard errors, ε , are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable =</i>	Management proposal support %			Governance proposal support %		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Quasi-Index %</i>	-0.859*** (0.324)	-0.855*** (0.323)	-1.073* (0.617)	0.872** (0.443)	1.111 (0.679)	1.253 (0.763)
Bandwidth	250	250	250	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	677	677	677	122	122	122
Observations	1,005	1,005	1,005	190	190	190

Table 7**Ownership by passive investors and hedge fund activism**

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive investors on the likelihood of hedge fund activism. Specifically, we estimate

$$Y_{it} = \alpha + \beta \text{Quasi-index}_{it} + \sum_{n=1}^N \theta_n (\text{Ln}(\text{Mktcap}_{it}))^n + \gamma \text{Ln}(\text{Float}_{it}) + \delta_t + \varepsilon_{it}$$

where Y_{it} is an indicator equal to 1 if firm i experiences a hedge fund activism event in year t , as defined in Brav, Jiang, Partnoy, and Thomas (2008) and Brav, Jiang, and Kim (2010). Quasi-index_{it} is the percentage of shares outstanding owned by quasi-index institutions (as classified by Bushee (2001)) for stock i at the end of September in year t . Mktcap_{it} is the CRSP market value of equity of stock i measured at May 31 in year t , and Float_{it} is the float-adjusted market value of equity (provided by Russell) at June 30 in year t , and δ_t are year fixed effects. We instrument Quasi-index in the above estimation using $R2000_{it}$, an indicator equal to one if firm i is part of the Russell 2000 index in year t . The Bushee classifications are defined in the text. The data consist of firms in the two Russell indexes for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period using bandwidths of 500 firms (columns 1-3) and 250 firms (columns 4-6) around the Russell 1000/2000 threshold, and polynomial order controls for $\text{Ln}(\text{Mktcap})$ of $N = 1, 2$, and 3. Standard errors, z , are clustered at the firm level.

<i>Dependent variable =</i>	Indicator for hedge fund activism event					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Quasi-index %</i>	-0.0014 (0.0011)	-0.0014 (0.0010)	-0.0023 (0.0016)	-0.0026 (0.0016)	-0.0026 (0.0016)	-0.0044 (0.0029)
Bandwidth	500	500	500	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	2,318	2,318	2,318	1,566	1,566	1,566
Observations	8,268	8,268	8,268	4,105	4,105	4,105

Table 8**Ownership by passive investors, cash holdings, and dividend policy**

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive investors on corporate decisions regarding cash holdings and payout policy. Specifically, we estimate

$$Y_{it} = \alpha + \beta \text{Quasi-index}_{it} + \sum_{s=1}^N \theta_s (\text{Ln}(\text{Mktcap}_{it}))^s + \gamma \text{Ln}(\text{Float})_{it} + \delta_t + \varepsilon_{it}$$

where: Y_{it} is cash_{it} , defined as the log of cash holdings for firm i in year t , or Payout_{it} , defined as the ratio of common dividends to net income for firm i in year t (data from Compustat); Quasi-index_{it} is the percentage of shares outstanding owned by quasi-index institutions (as classified by Bushee (2001)) for stock i at the end of September in year t ; MktCap_{it} is the CRSP market value of equity of stock i measured at May 31 in year t ; and Float_{it} is the float-adjusted market value of equity (provided by Russell) at June 30 in year t , and δ_t are year fixed effects. We instrument Quasi-index in the above estimation using $R2000_{it}$, an indicator equal to one if firm i is part of the Russell 2000 index in year t . The Bushee classifications are defined in the text. The data consist of firms in the two Russell indexes for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period using a bandwidth of 250 firms around the Russell 1000/2000 threshold and polynomial controls for $\text{Ln}(\text{Mktcap})$ of order $N = 1, 2$, and 3. Standard errors, ε , are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable =</i>	Ln(cash)			Dividend yield		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Quasi-index %</i>	-0.101*** (0.028)	-0.100*** (0.027)	-0.100* (0.046)	0.0008* (0.0004)	0.0008* (0.0004)	0.0010 (0.0008)
Bandwidth	250	250	250	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	1,516	1,516	1,516	1,514	1,514	1,514
Observations	3,983	3,983	3,983	3,976	3,976	3,976

Table 9**Ownership by passive investors and CEO compensation**

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive investors on the total CEO compensation. Specifically, we estimate

$$Y_{it} = \alpha + \beta \text{Quasi-index}_{it} + \sum_{n=1}^N \theta_n (\text{Ln}(\text{Mktcap}_{it}))^n + \gamma \text{Ln}(\text{Float})_{it} + \delta_t + \varepsilon_{it}$$

where Y_{it} is the log of total CEO compensation for firm i in year t (from Execucomp), Quasi-index_{it} is the percentage of shares outstanding owned by quasi-index institutions (as classified by Bushee (2001)) for stock i at the end of September in year t , MktCap_{it} is the CRSP market value of equity of stock i measured at May 31 in year t , and Float_{it} is the float-adjusted market value of equity (provided by Russell) at June 30 in year t , and δ_t are year fixed effects. We instrument Quasi-index in the above estimation using $R2000_{it}$ an indicator equal to one if firm i is part of the Russell 2000 index in year t . The Bushee classifications are defined in the text. The data consist of firms in the two Russell indexes for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period using bandwidths of 500 firms (columns 1-3) and 250 firms (columns 4-6) around the Russell 1000/2000 threshold, and polynomial order controls for $\text{Ln}(\text{Mktcap})$ of $N = 1, 2,$ and 3 . Standard errors, ε , are clustered at the firm level. * and ** indicate statistical significance at the 10% and 5% levels, respectively.

<i>Dependent variable =</i>	Ln(CEO total pay)					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Quasi-index %</i>	-0.046* (0.024)	-0.042** (0.021)	-0.051 (0.031)	-0.025 (0.037)	-0.022 (0.033)	-0.062 (0.075)
Bandwidth	500	500	500	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	1,501	1,501	1,501	996	996	996
Observations	5,633	5,633	5,633	2,657	2,657	2,657

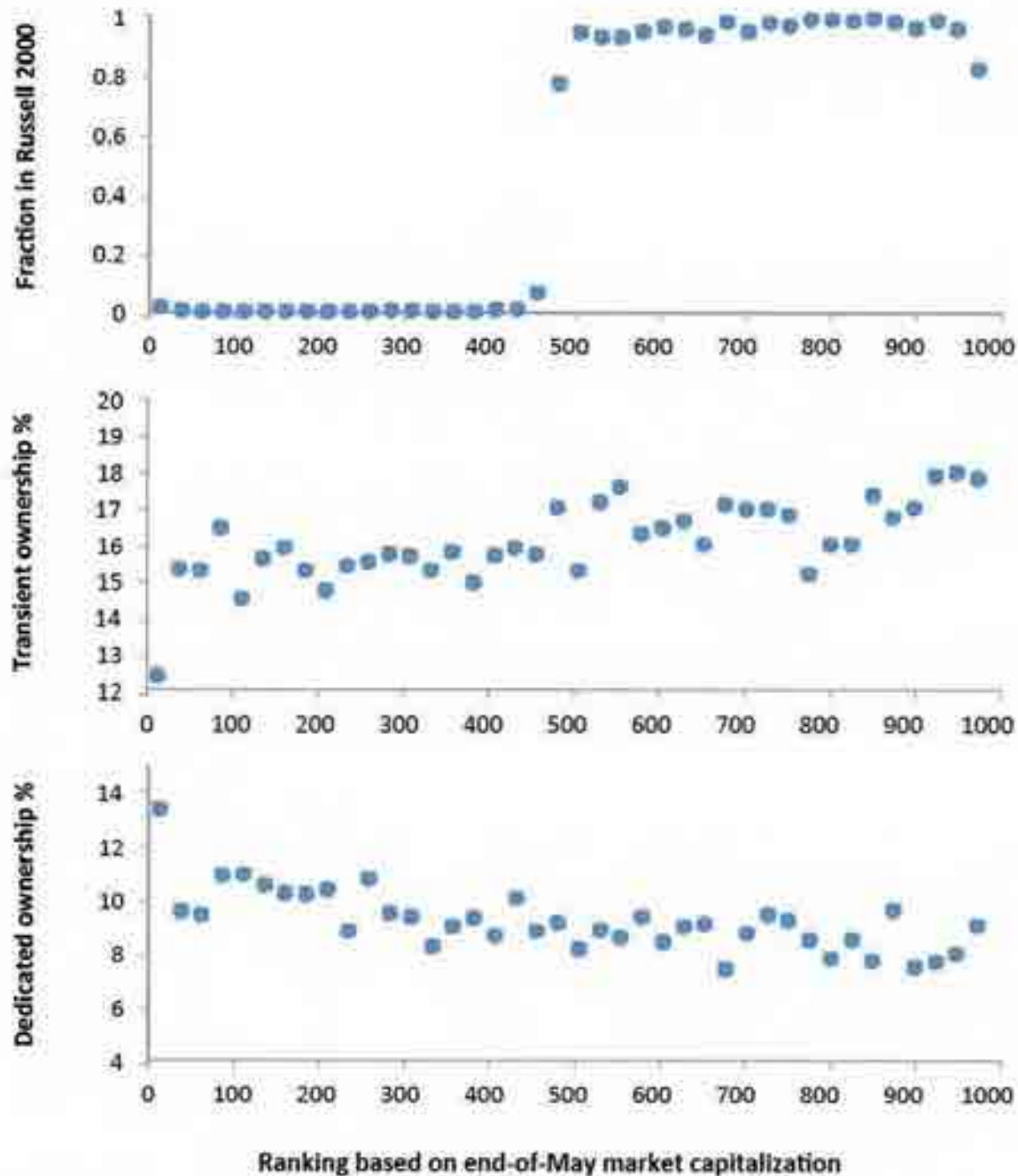
Internet Appendix for “Passive Investors, Not Passive Owners”

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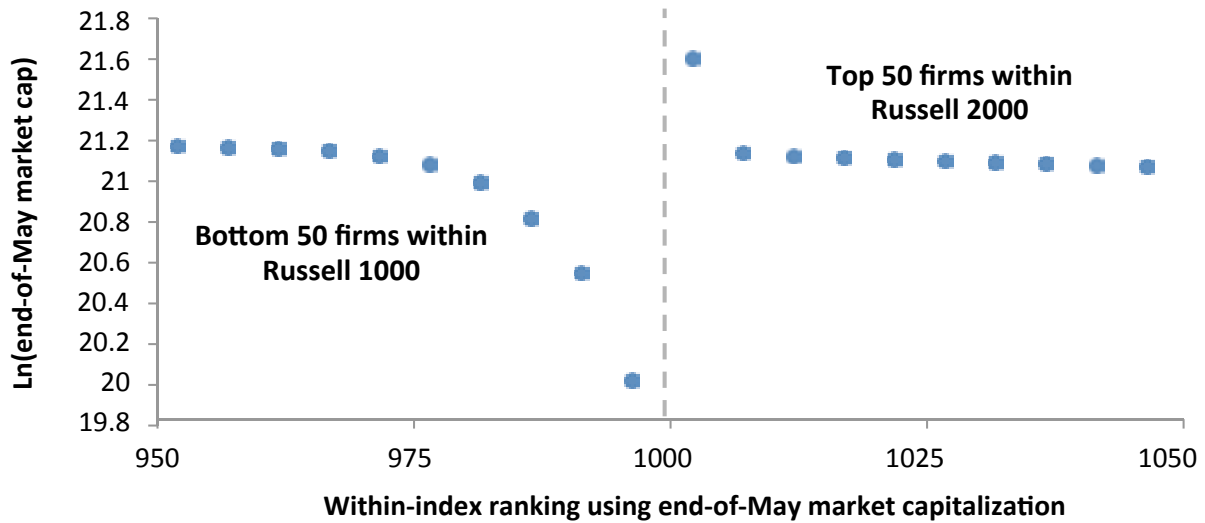
November 11, 2014



Appendix Figure 1

Index assignment, transient ownership, and dedicated ownership by market cap rankings for the bottom 500 firms of Russell 1000 and top 500 firms of Russell 2000

This figure plots the fraction of firm-year observations in the Russell 2000, transient ownership (%), and dedicated ownership (%) by ranking for the bottom 500 firms of the Russell 1000 and the top 500 firms of the Russell 2000, where ranking is determined using end-of-May market capitalization, as reported in CRSP. Averages are calculated using bins of 25 firms and data from 1998-2006.



Appendix Figure 2

Average $\text{Ln}(Mktcap)$ by ranking, where ranking is calculated using within-index rankings based on end-of-May market capitalizations

This figure plots the average $\text{Ln}(\text{end-of-May CRSP market cap})$ by size ranking for firms ranked between 950 and 1050, where ranking is determined using within-index end-of-May CRSP market caps. A ranking of 1000 reflects the firm with the lowest end-of-May market cap in the Russell 1000 index, while a ranking of 1001 reflects the firm with the highest end-of-May market cap in the Russell 2000 index. Averages are calculated using bins of five rankings for the years 1998-2006.

Appendix Table 1
Variable definitions

Variable Name	Source	Definition
<i>R2000</i>	Russell Investments	Indicator equal to 1 if firm is in the Russell 2000
<i>Institutional ownership %</i>	Thomson/CDA 13F files	Percentage of shares outstanding held by institutional investors
<i>Quasi-index %</i>	Brian Bushee website	Percentage of shares outstanding held by quasi-indexer institutions
<i>Dedicated %</i>	Brian Bushee website	Percentage of shares outstanding held by dedicated insitutions
<i>Transient %</i>	Brian Bushee website	Percentage of shares outstanding held by transient insitutions
<i>Independent director %</i>	Riskmetrics (Directors)	% of board seats held by directors classified as independent by Riskmetrics
<i>Poison pill removal</i>	Shark Repellent (FactSet)	Indicator equal to 1 if poison pill is withdrawn or allowed to expire at time t
<i>Greater ability to call special meeting</i>	Riskmetrics (Governance)	Indicator equal to 1 if shareholders better able to call a spec. meet. at time t
<i>Indicator for dual class shares</i>	Riskmetrics (Governance)	Indicator equal to 1 if a firm has dual class shares at time t
<i>Mngt. proposal support %</i>	Riskmetrics (Voting Results)	Percentage of "Yes" votes for management proposals
<i>Shareholder gov. proposal support %</i>	Riskmetrics (Voting Results)	Percentage of "Yes" votes for sharehold governance proposals
<i>Indicator for hedge fund activism</i>	Brav, Jiang, and Kim (2010)	Indicator equal to 1 if a firm has an activism event at time t
<i># management proposals passed</i>	Riskmetrics (Share. Props.)	Number of management proposals that pass
<i># CSR proposals</i>	Riskmetrics (Share. Props.)	Number of shareholder proposals related to corporate social responsibility
<i>Ln(Cash)</i>	Compustat	Ln(Cash and short term securities (<i>che</i>))
<i>Dividend yield</i>	Compustat	Common dividends (<i>dvc</i>) normalized by total market value of equity
<i>Ln(Total CEO pay)</i>	Execucomp	Ln(Total CEO compensation (<i>tdc1</i>))

Appendix Table 2

First stage estimation for transient institutional ownership

This table reports estimates of our first-stage regression of transient institutional ownership onto an indicator for membership in the Russell 2000 index plus additional controls. The specification is the same as in Table 3, except that the dependent variable is now $Transient_{it}$, which is the percentage of shares outstanding owned by transient institutions, as classified by Bushee (2001), for stock i at the end of September in year t .

<i>Dependent variable =</i>	Transient %					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>R2000</i>	0.421 (0.495)	0.363 (0.493)	0.013 (0.501)	0.475 (0.572)	0.257 (0.570)	0.259 (0.573)
Bandwidth	500	500	500	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	2,318	2,318	2,318	1,566	1,566	1,566
Observations	8,268	8,268	8,268	4,105	4,105	4,105
R-squared	0.05	0.05	0.05	0.08	0.08	0.08

Appendix Table 3

First stage estimation for dedicated institutional ownership

This table reports estimates of our first-stage regression of dedicated institutional ownership onto an indicator for membership in the Russell 2000 index plus additional controls. The specification is the same as in Table 3, except that the dependent variable is now $Dedicated_{it}$, which is the percentage of shares outstanding owned by dedicated institutions, as classified by Bushee (2001), for stock i at the end of September in year t .

<i>Dependent variable =</i>	Dedicated %					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>R2000</i>	-0.757 (0.602)	-0.837 (0.570)	-0.742 (0.609)	-0.750 (0.768)	-0.851 (0.700)	-0.743 (0.831)
Bandwidth	500	500	500	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	2,318	2,318	2,318	1,566	1,566	1,566
Observations	8,268	8,268	8,268	4,105	4,105	4,105
R-squared	0.02	0.02	0.02	0.01	0.01	0.01

Appendix Table 4A

First-stage estimations for Table 4

This table reports estimates of our first-stage regression of Quasi-index ownership onto an indicator for membership in the Russell 2000 index plus additional controls. The specification is the same as in Table 3, but we now restrict our sample to the smaller subsample of observations with non-missing Riskmetrics (Directors) data on board independence. Specifically, these are the first-stage estimates for the IV estimates reported in Table 4. *** indicates significance at the 1% level.

<i>Dependent variable =</i>	Quasi-index %					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>R2000</i>	3.668*** (0.752)	3.552*** (0.762)	3.279*** (0.758)	3.892*** (0.888)	3.663*** (0.930)	3.380*** (0.905)
Bandwidth	500	500	500	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
1st stage estimate for...	Table 4, Column (1)	Table 4, Column (2)	Table 4, Column (3)	Table 4, Column (4)	Table 4, Column (5)	Table 4, Column (6)
# of firms	1,570	1,570	1,570	1,037	1,037	1,037
Observations	5,604	5,604	5,604	2,685	2,685	2,685
R-squared	0.21	0.21	0.21	0.22	0.22	0.22

Appendix Table 4B

First-stage estimation for Table 5

This table reports estimates of our first-stage regression of Quasi-index ownership onto an indicator for membership in the Russell 2000 index plus additional controls. The specification is the same as in Table 3, but we now restrict our sample to the smaller subsample of observations with non-missing Shark Repellent (FactSet) data on poison pills or non-missing Riskmetrics (Governance) data on shareholders' ability to call special meetings and dual class share structures. Specifically, these are the first-stage estimates for the IV estimates reported in Table 5. *** indicates significance at the 1% level; ** indicates significance at the 5% level; * indicates significance at the 10% level.

<i>Dependent variable =</i>	Quasi-index %					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>R2000</i>	3.207*** (0.892)	3.160*** (0.843)	1.735* (0.967)	3.262*** (1.094)	2.824** (1.124)	2.556** (1.108)
Bandwidth	250	250	250	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
1st stage estimate for...	Table 5, Column (1)	Table 5, Column (2)	Table 5, Column (3)	Table 5, Columns (4) & (7)	Table 5, Columns (5) & (8)	Table 5, Columns (6) & (9)
# of firms	1,087	1,087	1,087	1,000	1,000	1,000
Observations	2,708	2,708	2,708	1,740	1,740	1,740
R-squared	0.251	0.251	0.257	0.18	0.18	0.18

Appendix Table 4C

First-stage estimation for Table 6

This table reports estimates of our first-stage regression of Quasi-index ownership onto an indicator for membership in the Russell 2000 index plus additional controls. The specification is the same as in Table 3, but we now restrict our sample to the smaller subsample of observations with non-missing Riskmetrics (Voting Results) data on % support for management proposals and shareholder-initiated governance proposals. Specifically, these are the first-stage estimates for the IV estimates reported in Table 6. *** indicates significance at the 1% level; ** indicates significance at the 5% level.

<i>Dependent variable =</i>	Quasi-index %					
	(1)	(2)	(3)	(4)	(5)	(6)
R2000	4.189*** (1.217)	4.184*** (1.211)	2.956** (1.400)	8.554*** (2.787)	6.894** (3.174)	6.537** (3.154)
Bandwidth	250	250	250	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
1st stage estimate for...	Table 6, Column (1)	Table 6, Column (2)	Table 6, Column (3)	Table 6, Column (4)	Table 6, Column (5)	Table 6, Column (6)
# of firms	677	677	677	122	122	122
Observations	1,005	1,005	1,005	190	190	190
R-squared	0.16	0.16	0.16	0.20	0.21	0.21

Appendix Table 4D

First-stage estimation for Table 9

This table reports estimates of our first-stage regression of Quasi-index ownership onto an indicator for membership in the Russell 2000 index plus additional controls. The specification is the same as in Table 3, but we now restrict our sample to the smaller subsample of observations with non-missing Execucomp data on total CEO pay. Specifically, these are the first-stage estimates for the IV estimates reported in Table 9. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable =</i>	Quasi-index %					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>R</i>2000	2.443*** (0.740)	2.682*** (0.725)	2.062*** (0.776)	1.732* (1.004)	1.912** (0.944)	1.221 (1.083)
Bandwidth	500	500	500	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
1st stage estimate for...	Table 9, Column (1)	Table 9, Column (2)	Table 9, Column (3)	Table 9, Column (4)	Table 9, Column (5)	Table 9, Column (6)
# of firms	1,501	1,501	1,501	996	996	996
Observations	5,633	5,633	5,633	2,657	2,657	2,657
R-squared	0.16	0.16	0.17	0.17	0.17	0.17

Appendix Table 5

Number of management proposals passed and number of CSR proposals

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive investors on the number and types of proposals passed. The specification is the same as in Table 5, and the proposal outcomes investigated in this table, from Riskmetrics, are: # of management proposals passed for firm i in year t and the number of shareholder-initiated CSR proposals for firm i in year t . The model is estimated over the 1998-2006 period using bandwidths of 250 firms (columns 1-3) and 500 firms (columns 4-6) around the Russell 1000/2000 threshold and a polynomial controls for $\text{Ln}(\text{Mktp})$ of order $N = 1, 2, \text{ and } 3$. Standard errors, ϵ , are clustered at the firm level. * and ** indicate statistical significance at the 10% and 5% levels, respectively.

<i>Dependent variable =</i>	# management proposals passed			# CSR proposals		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Quasi-index %</i>	-0.026 (0.021)	-0.027 (0.020)	-0.001 (0.029)	-0.008* (0.005)	-0.009** (0.004)	-0.017** (0.007)
Bandwidth	250	250	250	500	500	500
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	1,046	1,046	1,046	1,340	1,340	1,340
Observations	2,675	2,675	2,675	5,124	5,124	5,124

Appendix Table 6
Ownership by passive investors, ROA, and Tobin's Q

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive investors on firms' performance and value. The specification is the same as in Table 8, and outcomes investigated in this table, from Compustat, are: return on assets (ROA) firm i in year t and the log of Tobin's Q for firm i in year t . We instrument *Quasi-index* using $R2000_{it}$, an indicator equal to one if firm i is part of the Russell 2000 index in year t . The Bushee classifications are defined in the text. The data consist of firms in the two Russell indexes for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period using bandwidths of 250 firms around the Russell 1000/2000 threshold and a polynomial controls for Ln(Mktcap) of order $N = 1, 2,$ and 3 . Standard errors, ϵ , are clustered at the firm level.

<i>Dependent variable =</i>	ROA			Ln(Tobin's Q)		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Quasi-index %</i>	-0.003 (0.002)	-0.002 (0.002)	-0.004 (0.003)	-0.016 (0.016)	-0.016 (0.015)	-0.008 (0.026)
Bandwidth	250	250	250	250	250	250
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	1,449	1,449	1,449	1,341	1,341	1,341
Observations	3,753	3,753	3,753	3,404	3,404	3,404

Appendix Table 7

Ownership by passive investors, equity issuances, and financial leverage

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive investors on firms' equity issuances and overall financial leverage. The specification is the same as in Table 8, and the outcomes investigated in this table, from Compustat, are: equity issuances normalized by total assets firm i in year t and the book leverage for firm i in year t . We instrument *Quasi-index* using $R2000_{it}$, an indicator equal to one if firm i is part of the Russell 2000 index in year t . The Bushee classifications are defined in the text. The data consist of firms in the two Russell indexes for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period using bandwidths of 500 firms around the Russell 1000/2000 threshold and a polynomial controls for $\ln(\text{Mktcap})$ of order $N = 1, 2, \text{ and } 3$. Standard errors, ϵ , are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable =</i>	Net equity issuances / Assets			Book leverage		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Quasi-index %</i>	-0.003** (0.001)	-0.003** (0.001)	-0.002 (0.002)	0.0004 (0.0027)	0.0004 (0.0026)	-0.0005 (0.0038)
Bandwidth	500	500	500	500	500	500
Polynomial order, N	1	2	3	1	2	3
Float control	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes
# of firms	1,456	1,456	1,456	1,512	1,512	1,512
Observations	7,431	7,431	7,431	8,016	8,016	8,016

Appendix Table 8

Robustness of findings to using Russell-provided market capitalization

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive indexers on our governance and corporate outcome variables when we instead measure end-of-May market caps using Russell-provided market caps for the years 2002-2006. The estimation and outcomes are the same as in Tables 4-9, except $Mktcap_{it}$ is the Russell-provided end-of-May market cap of stock i in year t , except when it is missing (i.e., years 1998-2001), in which case, we use the CRSP market value of equity of stock i measured at May 31 in year t . We instrument $Quasi-index$ using $R2000_{it}$, an indicator equal to one if firm i is part of the Russell 2000 index in year t . The model is estimated over the 1998-2006 period using a bandwidth of 250 firms around the Russell 1000/2000 threshold and a second polynomial order control for $\ln(Mktcap)$. Standard errors, ϵ , are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable</i> =	Ind. directors %	Poison pill removal	Ability to call special meeting	Ind. for dual class shares	Mngt. proposal support %	Gov. proposal support %	HF activism event	Ln(cash)	Dividend yield	Ln(total CEO pay)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Quasi-index %</i>	1.329*** (0.391)	0.005 (0.003)	0.005** (0.002)	-0.027** (0.012)	-0.852** (0.332)	0.724 (0.776)	-0.0029* (0.0017)	-0.088*** (0.028)	0.0007* (0.0004)	-0.008 (0.024)
Bandwidth	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	1,037	1087	1000	1,000	677	122	1,566	1,516	1,514	996
Observations	2,685	2,708	1,740	1,740	1005	190	4,105	3,983	3,976	2,657

Appendix Table 9

Robustness of findings to using Compustat market capitalization

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive indexers on our governance and corporate outcome variables when we instead measure end-of-May market caps using Compustat. The estimation and outcomes are the same as in Tables 4-9, except that $Mktcap_{it}$ is the the Compustat market value of equity of stock i measured at May 31 in year t . We instrument $Quasi-Index$ in the above estimation using $R2000_{it}$, an indicator equal to one if firm i is part of the Russell 2000 index in year t . The model is estimated over the 1998-2006 period using a bandwidth of 250 firms around the Russell 1000/2000 threshold and a second polynomial order control for $\ln(Mktcap)$. Standard errors, ϵ , are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable =</i>	Ind. directors %	Poison pill removal	Ability to call special meeting	Ind. for dual class shares	Mngt. proposal support %	Gov. proposal support %	HF activism event	Ln(cash)	Dividend yield	Ln(CEO pay)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Quasi-index %</i>	1.765*** (0.457)	0.005** (0.002)	0.004** (0.002)	-0.064*** (0.0209)	-0.914*** (0.329)	1.139* (0.610)	-0.0022 (0.0014)	-0.090*** (0.027)	0.0008** (0.000)	-0.012 (0.030)
Bandwidth	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	983	1,016	943	943	641	115	1,470	1,422	1,419	939
Observations	2,562	2,536	1,652	1,652	956	181	3,887	3,773	3,763	2,523

Appendix Table 10
Robustness of findings to including industry fixed effects

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive indexers on our governance and corporate outcome variables when we add 2-digit SIC industry fixed effects. The data, outcome variables, and specification are the same as in Tables 4-9 except that we now also include 2-digit SIC industry fixed effects in the specification. The model is estimated over the 1998-2006 period using a bandwidth of 250 firms around the Russell 1000/2000 threshold and a second polynomial order control for Ln(Mktcap). Standard errors, ϵ , are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable =</i>	Ind. directors %	Poison pill removal	Ability to call special meeting	Ind. for dual class shares	Mngt. proposal support %	Gov. proposal support %	HF activism event	Ln(cash)	Dividend yield	Ln(Total CEO pay)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Quasi-index %</i>	1.182*** (0.333)	0.005* (0.003)	0.005** (0.002)	-0.044** (0.018)	-0.869** (0.377)	0.734 (0.607)	-0.0026 (0.0016)	-0.099*** (0.028)	0.0002 (0.0002)	-0.001 (0.024)
Bandwidth	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
2-digit industry fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	1,037	1,087	1,000	1,000	677	122	1,566	1,516	1,514	996
Observations	2,685	2,708	1,740	1,740	1,005	190	4,105	3,983	3,976	2,657

Appendix Table 11

Robustness of findings to including controls for firms that switch indexes

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of institutional ownership by passive indexers on our governance and corporate outcome variables when we add controls to account for firms that switched indexes. Specifically, the data, outcome variables, and specification are the same as in Tables 4-9 except that we now two additional controls to the specification: an indicator that equals one for firms that are in the Russell 2000 index in year t but were in the Russell 1000 in year $t-1$, and an indicator that equals one for firms that are in the Russell 1000 index in year t but were in the Russell 2000 index in year $t-1$. The model is estimated over the 1998-2006 period using a bandwidth of 250 firms around the Russell 1000/2000 threshold and a second polynomial order control for Ln(Mktcap). Standard errors, ϵ , are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable =</i>	Ind. directors %	Poison pill removal	Ability to call special meeting	Ind. for dual class shares	Mngt. proposal support %	Gov. proposal support %	HF activism event	Ln(cash)	Dividend yield	Ln(Total CEO pay)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Quasi-index %</i>	1.315*** (0.445)	0.005* (0.003)	0.003** (0.002)	-0.052*** (0.016)	-1.376** (0.631)	1.306** (0.651)	-0.0047** (0.0023)	-0.149*** (0.0486)	0.0004 (0.0005)	-0.037 (0.052)
Bandwidth	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Controls for movers	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	1,037	1087	1000	1,000	677	122	1,566	1,516	1,514	996
Observations	2,685	2,708	1,740	1,740	1005	190	4,105	3,983	3,976	2,657

Appendix Table 12

Robustness of findings to using only ownership of Barclays Bank, State Street, and Vanguard

This table reports estimates of the second-stage regression of our instrumental variable estimation to identify the effect of aggregate institutional ownership on our governance and corporate outcome variables. Specifically, we estimate

$$Y_{it} = \alpha + \beta \text{Passive}_{it} + \sum_{m=1}^N \theta_m (\text{Ln}(\text{Mktcap}_{it}))^m + \gamma \text{Ln}(\text{Float}_{it}) + \delta_t + \epsilon_{it}$$

where: Y_{it} is the outcome variable for firm i in year t , Passive_{it} is the percentage of shares outstanding owned by Barclays Bank, State Street, and Vanguard of stock i at the end of September in year t , Mktcap_{it} is the CRSP market value of equity of stock i measured at May 31 in year t , and Float_{it} is the float-adjusted market value of equity (provided by Russell) at June 30 in year t , and δ_t are year fixed effects. The outcome variables investigated in this table are the same as in earlier tables, and we instrument Passive in the above estimation using $R2000_{it}$, an indicator equal to one if firm i is part of the Russell 2000 index in year t . The data consist of firms in the two Russell indexes for which we obtain 13F holdings data from Thomson/IDC and which we match with data from the monthly CRSP file. The model is estimated over the 1998-2006 period using a bandwidth of 250 firms around the Russell 1000/2000 threshold and a second polynomial order control for $\text{Ln}(\text{Mktcap})$. Standard errors, ϵ , are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

<i>Dependent variable =</i>	Ind. directors %	Poison pill removal	Ability to call special meeting	Ind. for dual class shares	Mngt. proposal support %	Gov. proposal support %	HF activism event	Ln(cash)	Dividend yield	Ln(Total CEO pay)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Passive %</i>	4.371*** (0.954)	0.009** (0.004)	0.011*** (0.004)	-0.130*** (0.025)	-3.308*** (0.943)	1.110 (3.162)	-0.006* (0.0031)	-0.224*** (0.065)	0.002** (0.001)	-0.037 (0.053)
Bandwidth	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	1,037	1,087	1,000	1,000	677	122	1,566	1,516	1,514	996
Observations	2,685	2,708	1,740	1,740	1,005	190	4,105	3,983	3,976	2,657