Passive Investors, Not Passive Owners*

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Abstract

Passive institutional investors are an increasingly important component of U.S. stock ownership, and their influence on firm-level governance is widely debated. To examine whether and by which mechanisms passive investors influence firms' governance structures, we use an instrumental variable estimation and exploit variation in passive institutional ownership that results from stocks being assigned to either the Russell 1000 or 2000 index. Our findings suggest that passive investors play a key role in influencing firms' governance choices; 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. Consistent with the observed differences in governance having a positive influence on firm value, we find that passive ownership is also associated with improvements in firms' longer-term performance.

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"We're going to hold your stock when you hit your quarterly earnings target. And we'll hold it when you don't. We're going to hold your stock if we like you. And if we don't. We're going to hold your stock when everyone else is piling in. And when everyone else is running for the exits. That is precisely why we care so much about good governance."

— F. William McNabb III, Chairman and CEO of the Vanguard funds

I. Introduction

While there is considerable evidence that institutional investors influence the governance and corporate policies of firms (e.g., Aghion, Van Reenen and Zingales (2013); Brav et al. (2008)), this evidence 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 "active" investors represent only a subset of institutional investors. Increasingly, many institutions are instead "passive" investors that hold diversified portfolios of stocks with low turnover 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 minimal fees and expenses. The rapid growth of such passive investors is illustrated in Figure 1, which demonstrates that the share of equity mutual fund assets held in passively-managed funds more than doubled over the 1998-2014 period to 33.5%.[1] The growing and large ownership stakes of such passive investors raises questions about how effectively managers are being monitored. Many worry that passive institutional investors lack both the motives and mechanisms to monitor their large, diverse portfolios, and that the increasing market share of such "lazy investors" weakens firm-level governance and hurts performance (*The Economist*, 2015). However, others counter that passive investing does not equate with passive ownership.[2] In this paper, we examine whether passive institutional investors influence firms' governance structures, and ultimately, performance.

There are many reasons to suspect that the growth of passive investors weakens the governance of firms. First, such institutional investors may lack an incentive to monitor managers. 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 one stock's

[1] Figure 1 is based on data from the CRSP Mutual Fund File. At the end of December 2014, we estimate the total assets in passively-managed U.S. equity funds (including ETFs) was $2.7 trillion. 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. See http://online.wsj.com/articles/investors-pour-into-vanguard-eschewing-stock-pickers-1408579101.

[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)".

performance will simply increase the performance of both the institution's portfolio and the underlying benchmark. Second, such investors may be less able to exert influence over managers. Specifically, by seeking to minimize deviations from the underlying index weights, passive institutions lack a traditional lever used by non-passive investors to influence managers—the ability to accumulate or exit positions. Third, given their diversified holdings across hundreds of stocks, passive investors may lack the resources necessary to research and individually monitor each stock in their portfolio.

And yet, there are reasons why passive investors may seek to improve firms' governance choices and performance. 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 (Black (1992)). Moreover, because passive institutions are less able to divest their positions in poorly performing stocks, they may place even greater weight than active fund managers on ensuring effective governance in the firms they own (Romano (1993), p.83). Finally, all institutional investors have a fiduciary duty to manage their funds and vote their proxies in the best interest of shareholders.

There are also several mechanisms by which passive investors might exert influence. 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.[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' efforts to rally support for their demands (Brav et al. (2008), Bradley et al. (2010)). Bringing just a few passive institutions on board can lend creditability 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 (1992), Black (1998)).

Identifying the impact of passive investors on firms' corporate governance and other policies can

[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)).

[4] For example, the activist hedge fund ValueAct was successful in obtaining a board seat on Microsoft with less than 1% 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%, 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.

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 firms' investment opportunities or ownership by active investors—that directly affect firms' choices. Simultaneity bias could also distort these relations. For example, investors in passive funds 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.[5] The Russell 1000 comprises the largest 1,000 U.S. stocks, in terms of market capitalization, and the Russell 2000 comprises the next largest 2,000 stocks. 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 1,000th largest stocks will be included in the Russell 1000 and be given very small portfolio weights within the index because they represent the smallest firms in their index, while the 1,001st through 1,250th largest stocks will be included in the Russell 2000 and be given weights 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 difference 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 even though these stocks are otherwise similar in terms of their overall market capitalization. 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 in passive ownership matches what one would predict based on the amount of money estimated to be passively tracking the two indexes and corresponds with a significant shift in firms' ownership structure. On average, the ownership stakes of Vanguard, State Street, and Barclays Bank (which owned iShares during our sample) are a third higher among firms at the top of the Russell 2000, and each of these three institutions' likelihood of owning more than 5% of a firm's shares, is higher, on average by two thirds, while their likelihood of being a top 5 shareholder is higher, on average, by 15%. We find *no* corresponding difference in ownership of stocks

[5] This identification setting has been used by several recent papers (e.g., Boone and White (2014); Crane, Michenaud, and Weston (2014); Lu (2013); Mullins (2014)). However, as discussed further below, our empirical methodology specifically isolates the effects of *passive institutional investors* (rather than institutional investors more generally) and avoids a source of endogeneity present in these previous studies.

around the cutoff among more active institutions, suggesting the greater passive institutional ownership at the top of the Russell 2000 coincides with a lower ownership of these stocks by retail investors.

Exploiting this variation in ownership around the Russell 1000/2000 cutoff in an instrumental variable (IV) estimation, we are able to assess the effect of passive investors on firms' governance structures. Specifically, we instrument for 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.[6]

The governance outcomes we choose to analyze reflect those that the largest passive institutional investors explicitly state as being important. While passive institutions do vary their voting strategy across firms on governance issues (e.g., see Davis and Han (2007)), 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, (2) oppose antitakeover provisions that can reduce board accountability, including poison pills and restrictions on shareholders' ability to call special meetings, and (3) oppose unequal voting rights, such as dual class shares (e.g., see 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 activist hedge funds making demands upon management.

Using our IV approach, we find that passive investors have a significant impact on key aspects of firms' governance structures. First, an increase in ownership by passive investors is associated with an increase in the share of independent directors on a board. Relative to the sample average, a 10% increase in ownership by passive investors is associated with a 9% increase in the share of directors on a firm's board that are independent; and this association is even larger before the NYSE and Nasdaq ruled in 2003 that listed firms are required to have a majority of independent directors. Second, passive ownership is associated with the removal of antitakeover defenses. A one percentage point increase in ownership by passive investors is associated with 0.5 percentage point increase in the likelihood of removing a poison pill and of reducing restrictions on shareholders' ability to call special meetings. These findings are

[6] Another advantage of our identification strategy is that it does not depend on one's ability to classify passive and non-passive institutional investors. Because the IV estimation only uses variation in institutional ownership that is driven by index assignment, the estimation and its assumptions are not sensitive to using either total institutional ownership or commonly-used definitions of passive ownership as the key explanatory variable to be instrumented. The interpretation of the local average treatment effect we estimate will remain the same. See Sections III.B and IV.B for more details.

economically large given that, on average, only 4% of firms remove a poison pill and 0.7% of firms eliminate restrictions on special meetings each year during our sample period. Finally, an increase in passive ownership is also associated with firms being less likely to have dual class shares, a device used to give certain shareholders (e.g., firm founders) voting control.

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% increase in ownership by passive investors is associated with about a 4% decline in support for management proposals and about a 10% 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 an alternative mechanism by which passive investors' ownership stakes influence governance outcomes—by facilitating the activist efforts of other investors. 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. However, these findings do not exclude the possibility that passive investors' ownership stakes increase the *threat* of activism by others, and that some of the observed responses are driven by this increased threat. For example, companies may be responsive to the governance views of passive investors so as to lessen the likelihood such investors later lend support to an activist campaign initiated by others.

Contributing to the ongoing debate regarding the performance and value implications of various governance structures (e.g., Stein (1988), Bhagat and Black (2002), Hermalin and Weisbach (2003)), we find that an increase in passive ownership is associated with an improvement in firms' future performance. We find no evidence of an association between passive ownership and measures of performance in our main IV specification, but if we isolate the longer-term impact of passive ownership by adding controls for stocks that recently switched indexes, we find evidence that passive ownership is associated with significant improvements in firms' return on assets (ROA). On average, a 10 percent increase in ownership by passive investors is associated with about a fifth of standard deviation increase in ROA. We also find that ownership by passive investors is associated with reduced cash holdings, a higher dividend yield, and suggestive decline in managerial pay, all of which have been associated with improvements in performance and reductions in agency problems associated with free cash flows. We do not find much evidence, however, that passive ownership is associated with differences in firms' capital structure or investments. Combined, these findings are consistent with passive investors improving firm value by insisting on basic governance-related changes, as these require a low level of costly monitoring, while avoiding more costly interventions to alter firms' investment or capital structure.

Our findings are robust to various specification choices. For example, 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 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 (1) controlling for firms' float-adjusted market cap, which is a proprietary measure used by Russell to determine a stock's ranking within indexes, (2) controlling for firms' industry, (3) controlling for firms' stock liquidity, and (4) controlling for whether firms recently switched 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, and we find no effect of passive ownership in placebo tests that assume jumps in passive ownership at alternative market cap thresholds (i.e., instead of the Russell 1000/2000 cutoff).

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 willingness and ability to influence firms' policy choices, our evidence suggests that passive investors adopt general principles of what constitutes an effective governance structure, as proposed in Black (1992), and successfully influence firms' governance and other policy choices 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. 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)).[7] 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

[7] 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).

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 firm performance and some aspects of corporate policy.[8]

Finally, our work is related to recent papers that use the Russell 1000/2000 cutoff to analyze the price effects of additions and deletions from a market index (Chang, Hong, and Liskovich (2014)), the importance of institutional investors' portfolio weights for monitoring incentives (Fich, Harford, and Tran (2015)), and the association between total institutional ownership and corporate policies like payouts, investment, the composition of CEO pay, management disclosure, and acquisitions (Boone and White (2014); Crane, Michenaud, and Weston (2014); Lu (2013); Mullins (2014)). In contrast to these papers which study total institutional ownership, we use the Russell 1000/2000 cutoff to isolate variation in ownership by *passive institutional investors*, and we analyze the impact of such investors on governance outcomes they explicitly mention as being important (e.g., independent directors, fewer takeover defenses, and equal voting rights), and the mechanisms by which passive investors might influence such governance outcomes (e.g., proxy voting, shareholder proposals, and facilitating activism by others).

Beyond our focus on passive investors and their impact on governance outcomes, our findings also differ considerably from previous and contemporaneous papers that use the Russell cutoff as a source of identification. In particular, Boone and White (2014), Crane, Michenaud, and Weston (2014), and others argue that there is a much larger 10-25 percentage point difference in *total* institutional ownership around the cutoff that is driven by a difference in *both* passive and active institutional ownership. We demonstrate that there is only a 2-4 percentage difference in *passive* ownership around the cutoff, and that the larger difference reported in past papers is driven by endogenity that remains in their research design – they compare stocks around the threshold *after* endogenously resorting stocks within indexes using Russell's float-adjusted market cap based rankings. Due to the inclusion of the float-adjusted market caps in their identification, these papers are essentially comparing the least liquid, high inside ownership stocks of the Russell 1000 to the most liquid, low inside ownership stocks of the Russell 2000. Thus, they overstate the impact of index assignment on firms' ownership structure, and wrongly attribute differences

[8] In this regard, our findings complement those of Iliev and Lowry (forthcoming), who analyze 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. Choi, Fisch, and Kahan (2013) find similar evidence that the voting decisions of Vanguard, and other large fund families, vary substantially from ISS vote recommendations. Our findings demonstrate that the active monitoring and voice of passive investors results in actual differences in firms' governance structures and corporate policies.

in firms' capital structure, investments, composition of managerial pay, and other outcomes to index assignment. These issues are discussed further in Section VII.C.

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 merge stock-level data on institutional ownership and Russell equity index membership 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 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 U.S., 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). 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.[9]

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 institutional categories: (i) "quasi-indexers" (low turnover, high diversification – e.g., Vanguard and State Street); (ii) "transient" (high turnover, high diversification – e.g., Janus Capital Management, Morgan Stanley); and (iii) "dedicated" (low turnover, low diversification – Berkshire Hathaway, Wellington (Windsor)).[10] To generate variables for institutional ownership disaggregated into these three types, we compute the percentage of the market capitalization for stock *i* owned by quasi-indexers, transient, and dedicated institutions at the end of September of year *t*.

[9] On occasion, an institution will report its holdings late, so that the report date and filing date in the Thomson data are not the same. As these holdings are not current, we also 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).

[10] To avoid changes in the classification of an institution over time, we use Bushee's "permanent" classification. As discussed in Section VII.B, our findings are also robust to using alternative methods to classify institutions. See Bushee's website for details: http://acct.wharton.upenn.edu/faculty/bushee/IIclass.html.

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 performance, 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 institution level (e.g., see Appendix), and consistent with this, Rothberg and Lilien (2006), Choi, Fisch, and Kahan (2013), 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 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, 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 1,000 and next 2,000 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 and of ending the sample prior to 2007 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 three-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. 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.

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. Sample and descriptive statistics

For our main analysis, we restrict our sample to stocks in the 250 and 500 bandwidths around the cutoff, as determined using the end-of-June Russell-assigned portfolio weights for stocks within each index. This sample spans an economically important set of midcap and small cap stocks that includes 1,000 of the 1,500 largest (in terms of market capitalization) U.S. publicly-listed firms.

Table 1 reports summary statistics for firms in these two 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, firms' ROA averages about 0.03.

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 performance might not reflect a causal relation since ownership by passive investors might be correlated with factors—such as firms' access to capital, investment opportunities, 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; for example, investors in passive funds may prefer to invest in funds that track indexes that contain firms with 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 its market capitalization weight in the 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.

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 weight in the index is then determined using its end-of-June 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,

[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, 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).

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 end-of-June 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 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 confirmed in Figure 3, where we sort the top 500 stocks of the Russell 2000 and bottom 500 stocks of the Russell 1000, as determined using the end-of-June Russell-assigned portfolio weights within each index, 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 end-of-September percent ownership by quasi-index institutional investors. By construction, the top-left 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-left panel, there is a rather large jump in the probability of being assigned to the Russell 2000 index around this break. 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-left panel of Figure 3 demonstrates a distinct jump in the ownership of passive investors around this midway point. On average, quasi-index investors own 40.4% of the top 500 firms of the Russell 2000, but only own 37.8% of the bottom 500 firms in the Russell 1000 (p-value of difference < 0.001).

The magnitude of the observed difference in passive ownership corresponds well to the magnitude one would predict using estimates of the total amount of passive assets tracking each of the two indexes. While the Russell 1000 is more than 10 times larger in total market cap than the Russell 2000 during our sample period, there is only about 2 to 3 times more dollars passively tracking the Russell 1000 relative to the Russell 2000 (see Table 1, Panel A of Chang, Hong, and Liskovich (2014)). Using their estimates for 2004, $38.9 billion in assets were passively tracking the Russell 2000, which accounts for about 3.14% of the index's total market cap of $1,237 billion, while there was only $84.9 billion of assets passively tracking the Russell 1000, accounting for just 0.71% of the index's total market cap of $12,002 billion. Based on these estimates, assignment to the Russell 2000 in that year would increase a stock's passive institutional ownership by about 2.5 percentage points, which is similar to the increase shown in Figure 3 and in our later estimations. Similar increases in passive ownership are predicted for other years of our sample period.[13] In practice, the realized differences in passive ownership will be slightly larger around the cutoff than predicted by this simple back-of-the-envelope calculation because passive funds' place more emphasis on tracking the largest stocks within the benchmark.

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% 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%.[14]

We find no evidence that index assignment is related to ownership by actively managed funds. This is shown in the remaining two panels of Figure 3 where we plot the percent ownership for transient and dedicated institutional investors. As seen in those panels, there is no corresponding difference in either transient or dedicated institutional ownership; we formally test and demonstrate this lack of a difference in other types of ownership in Section III.C. 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 driven by passive funds rather than active funds.

[13] The disproportionate amount of money passively tracking the Russell 2000 occurs because the Russell 2000 is the most widely used market index for small cap stocks. The Russell 1000, which spans both large and midcap stocks, is less widely used as a benchmark because it faces more competition from other large cap and midcap market indexes, including the S&P 500 (which is the most popular market index), the CRSP U.S. midcap index, and the S&P 400 midcap index.

[14] The importance of index assignment can also be seen at the fund level. Using the Thomson Reuters S12 fund-level database, we find that among the 50 largest mutual fund holdings for each stock, there are 16.5% more fund names that include the word "index" for the 250 stocks at the top of the Russell 2000 relative to the 250 stocks at the bottom of the Russell 1000.

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

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

where Y_{it} is the outcome of interest for firm i in year t, $Quasi\text{-}index_{it}$ 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 calculated by Russell. We control for float-adjusted market capitalization because it is used by Russell to compute portfolio weights 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)). 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

[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)).

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, 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). We verify the relevance condition below in our first stage estimations, and the exclusion restriction seems reasonable 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, 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] In particular, 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 N we use to control for end-of-May market capitalization.

The use of $R2000_{it}$ as an instrument allows us to isolate an exogenous source of variation in passive ownership. While non-index funds that passively seek to deliver the performance of a benchmark portfolio have discretion over which stocks to hold within the benchmark, the instrumental variable never uses such endogenous variation in passive ownership; the IV estimation *only* uses variation in ownership that is driven by a stock's index assignment *and* the reshuffling of holdings by institutions that seek to minimize the tracking errors of their passive funds. For this reason, our IV strategy is also not sensitive to the specific measure of institutional ownership we use in the first stage of the 2SLS estimation. In particular, one could use *total* institutional ownership in the first stage of the estimation without affecting the interpretation of the local average treatment effect being identified in the IV estimation. We use *Quasi-index* as our main measurement of ownership since it eliminates noise from non-passive holdings and improves the precision of our first stage estimates (see below). However, as shown in Section VII, our subsequent findings are robust to using both wider and narrower definitions of ownership.

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

[16] The instrumental variable (IV) estimation is implemented using the standard two-stage least squares (2SLS) estimation, and as further support of the need for our IV estimation, a Durbin-Wu-Hausman test, as proposed in Wooldridge (1995), rejects the exogeneity of *Quasi-index* in 10 of the 11 outcomes we analyze in Sections IV-VI of the paper. The OLS estimates when using the 250 bandwidth and a second polynomial order control for Ln(*Mktcap*) are reported in Appendix Table 2; the OLS estimates using alternative bandwidths or controls for Ln(*Mktcap*) are qualitatively similar. The OLS estimates differ considerably from the IV estimates reported in Sections IV-VI. For example, in an OLS estimation, *Quasi-index* is unrelated to takeover defenses, while in our later IV estimates, we demonstrate that *Quasi-index* is associated with significantly fewer takeover defenses

[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).

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

where $Quasi\text{-}index_{it}$ is the percentage of shares outstanding owned by quasi-indexers and $R2000_{it}$ is a dummy variable equal to 1 if stock i is in the Russell 2000 Index at end of June in year t. 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, confirm 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 more 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.[18]

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% 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 1% level.[19]

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 3 and 4. 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.

We also do not find evidence that membership in the Russell 2000 is associated with an increase in the visibility of a stock and subsequent analyst coverage, which is another mechanism by which index

[18] 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.

[19] Because our IV model is just-identified, the IV estimation is median-unbiased and weak instruments are unlikely to be a concern in our setting, especially given the strong first stage estimates (Angrist and Pischke, 2009). Additionally, the Kleibergen-Paap F stat on the excluded instrument exceeds 10, providing further confidence that a weak instrument is unlikely to be a concern (see Stock, Wright, and Yogo (2002) and Angrist and Pischke (2009)).

assignment might improve firms' governance. In particular, if we re-estimate Equation (2) instead using the number of analysts as the dependent variable, we find no evidence that assignment to the top of the Russell 2000 is associated with greater analyst coverage; if anything, we find evidence that inclusion in the Russell 2000 is associated with less analyst coverage but the estimates are not robust to wider bandwidths. Likewise, Crane, Michenaud, and Weston (2014) find no evidence of an increase in media coverage among firms at the top of the Russell 2000. The lack of an increase in either analyst or media coverage among firms at the top of the Russell 2000 bolsters our assumption that index assignment in our setting will only affects firms' governance structure through its effect on passive ownership.

D. Why index assignment may matter

A question that naturally arises is why index assignment might matter at all for firms' passive ownership. If the increased ownership stake that comes with a stock being assigned to the Russell 2000 index allows passive investors to exert additional influence and correct a governance structure they deem suboptimal (as shown below), why would passive investors not also increase their ownership stake among stocks at the bottom of the Russell 1000 so as to exert more influence among those companies as well? In other words, what would prevent passive institutions from being more active, and hence, undoing the potential importance of index assignment?

There are two likely explanations for why index assignment may matter for firms' governance structures. First, passive institutions are simply more focused on minimizing expenses and tracking errors than on affecting governance. While increasing an ownership stake for one stock at the bottom of the Russell 1000 might not significantly affect a fund's tracking errors relative to a Russell 1000 benchmark, a similar increase for a number of other stocks would. Moreover, such targeted activism would likely increase fund expenses since the passive investor would need to research which stocks to target. Combined these two effects would likely result in lost market share to competitors with lower costs and lower tracking errors. Second, index assignment may create a coordinated increase in ownership by passive institutions that might otherwise be hard to replicate. An ownership stake increase of about 3 percentage points, the average increase in our setting, may be prohibitively large for any one passive institution to achieve, and coordinating a combined ownership increase among multiple passive institutions may either be too costly or impose additional regulatory disclosure requirements these institutions wish to avoid.

Overall, our finding that index assignment corresponds with a shift in passive ownership confirms that passive institutions are not active in the traditional sense of trying to accumulate or exit positions since such actions would undo the importance of index assignment. We now turn to analyzing whether passive ownership and index assignment affect firms' governance structures and the potential mechanisms by which passive investors may exert influence.

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. 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.

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% increase in the share of directors that are independent for a 10% 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).[20]

The impact of passive investors on board independence is even larger prior to changes regarding board independence requirements at the NYSE and Nasdaq exchanges. In late 2002, both exchanges

[20] 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 5A. The first stage estimates for our later estimates in Tables 6, 7, 8, and 11 can be found in Appendix Tables 5B-5D, respectively. We do not separately report first stage estimates for Tables 9, 10, and 12 since their samples are comparable to that used in Table 3.

proposed changes to require that all firms listed on the exchange have a majority of independent directors, and the SEC approved the proposed changes in 2003. Consistent with passive investors having more of an influence on board independence prior to 2003, we find that a 1 percentage point increase in ownership by passive investors is associated with a 2.27 to 2.72 percentage point increase in number of independent directors on a firm's board prior to 2003 in the smaller bandwidth of 250 stocks (Table 5, columns 1–3) but only a 0.74 to 0.78 percentage point increase after 2002 (columns 4–6). The differences in the estimates across time period are statistically significant at the 5 percent confidence level.[21]

B. Takeover defenses

We now consider the association between passive investors and two additional dimensions of corporate governance related to takeover defenses – poison pills and restrictions on shareholders' ability to call special meetings. Opposition to takeover defenses are common themes of passive investors' proxy voting guidelines (see Appendix). Table 6 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%) 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, 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 6. The estimated coefficient when using a first- or second-order polynomial control for Ln(*Mktcap*) is positive

[21] While the proposed exchange listing requirements did not become effective until 2004, many firms began complying in 2003. Given this, we follow Chhaochharia and Grinstein (2009) and use the year 2003 as the potential breaking point; see Chhaochharia and Grinstein (2009) for more details.

[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.dimensional.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.

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 6, 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% 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 6.

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%, the magnitude is sizable.[24]

C. Equal voting rights and dual class shares

Finally, we consider whether ownership by passive investors is associated with whether or not a firm has dual class shares, as determined by Riskmetrics. Passive institutions uniformly support equal voting rights and oppose dual class shares and other forms of unequal voting rights (see the Appendix for examples). Moreover, 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. 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 Table 7. 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

[24] 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.

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.[25]

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), Bradley et al. (2010)). 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 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.

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 (Table 8, columns 1–3). 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

[25] Because adding a dual class share structure is typically not allowed by stock exchanges after a firm's initial IPO, the observed difference in dual class structures is most likely driven by firms removing a dual class share structure rather than failing to add one. Consistent with this, in unreported estimates we find that passive ownership is positively associated with the removal of dual class shares, but unlike our findings for poison pills and restrictions on shareholder meetings, the estimates are not statistically significant at conventional levels. This is likely attributed to the relatively small number of companies that make such changes following their initial public offering; on average, only about 0.9 percent of firms remove a dual class share structure each year in our sample.

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.[26]

We next analyze support for shareholder proposals and find evidence that ownership by passive 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 8, 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% increase in ownership by passive investors is associated with a 9%–13% increase in support for shareholder proposals. The lower statistical significance likely reflects the relatively small number of such proposals. Finally, with the exception of fewer proposals related to corporate social responsibility (CSR), we find no relation between ownership by passive investors and differences in the types of shareholder proposals voted on.

Overall, our findings regarding shareholder votes support the possibility that the voice of passive investors has a significant impact on corporate governance of firms.

B. Increased activism by others

Another possible mechanism by which passive ownership might influence firms' governance structure is by facilitating activisms 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), Bradley et al. (2010)). Bringing just a few of these large investors on board can lend

[26] 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. The lack of difference in the total number of proposals passed is likely attributable to many management proposals being related to routine business matters.

creditability 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* activism among firms with greater passive ownership. 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.[27] These estimates are reported in Table 9. The point estimates are always negative, and while not statistically significant at conventional levels, the estimates are economically large. In the 250 bandwidth, 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 increases the *threat* of activism by others, or that this threat increases the influence of passive investors "voice". Concerned about an increased threat of activism, managers may be responding to the views of passive investors and be taking actions even on issues not necessarily subject to shareholder votes, such as poison pills, to preempt an actual activist campaign. Anecdotal evidence suggests that informal discussions between passive institutions and managers, backed up with the threat of voice, are often used to exert influence.[28] Such preemptive actions would reduce the need for activism and could explain the suggestive decline in actual activism events.

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

Ownership by passive investors might also be associated with differences in firm performance, managerial compensation, or corporate policies. Overall performance or corporate policies might differ if the observed differences in governance associated with passive investors help mitigate managerial agency conflicts or if managers adjust corporate policies so as to preempt hedge fund activism campaigns that rely on the support of passive investors. We now explore this possibility.

[27] 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.

[28] 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)). And in a speech from October 2014, the CEO and Chairman of the Vanguard group, F. William McNabb, noted that Vanguard sent out 923 letters to firms in 2013, 358 of which requested specific changes in governance, and that 80 of these companies had adopted substantive changes without having to go through a shareholder proposal (see McNabb (2014)).

A. Overall performance

There is considerable debate about the value implications of various governance structures or whether the potential influence of passive investors will necessarily improve firm performance. Because greater board independence, fewer antitakeover defenses, and the absence of dual class shares arguably increase shareholder rights, one might expect that passive ownership mitigates agency conflicts and is associated with improved performance. However, theory suggests that board independence might be a result rather than a cause of performance (Hermalin and Weisbach (1998)), and the empirical evidence regarding the performance implications of board independence is mixed (e.g., Bhagat and Black (2002); Hermalin and Weisbach (2003)). Likewise, the value implication of removing poison pills and other takeover defenses is debatable (e.g., Stein (1988), Coates (2000)). More broadly, one might also argue that the optimal governance structure may vary considerably across firms (e.g., Coles, Daniel, Naveen (2008); Duchin, Matsusaka, Ozbas (2010)), and hence, the potential "one-size-fits-all" governance view of passive investors may not always represent an improvement for individual firms.

Consistent with the governance structure promoted by passive investors having a positive impact on performance for the average firm, we find evidence that ownership by passive investors is related to an overall improvement in firms' future performance, as measured using firms' return on assets (ROA). Although passive ownership is not associated with significant differences in firms' overall ROA in our main specification (Table 10, columns 1-3), it is positively associated with firms' ROA after adding controls for whether a firm switched indexes that particular year (columns 4-6). This is because improvements in performance may take time to manifest, and one would not expect to find a relation between changes in passive ownership and performance for firms that just switched indexes. Consistent with this, we find that adding controls for such recent movers reveals a positive and statistically significant association between passive ownership and ROA. On average, a 10 percent increase in passive ownership is associated with about a fifth of a standard deviation increase in ROA. In unreported estimates, we also find that passive ownership is positively associated with Tobin's Q, another commonly used measure of firm performance.[29]

B. Executive compensation

There has been much debate regarding managerial pay and whether its growth reflects an efficient market outcome or an agency conflict and passive investors commonly discuss the importance of using compensation to properly reward and incentivize managers (see proxy-voting guidelines in the Appendix). 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.

[29] Similar to ROA, we find a positive association between passive ownership and Tobin's Q only after controlling for whether a firm switched indexes that year. Importantly, our earlier estimates for governance and vote outcomes are unaffected by the inclusion of the additional controls for whether a firm switched indexes that year. These robustness tests are discussed in Section VII.A.

We find less evidence that ownership by passive investors is associated with a difference 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 11, columns 1-3), and the estimate is statistically significant when using either a first- or second-order polynomial control for 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 relatively 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.[30]

C. Cash, dividend, financing, and investment policies

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 12.

Consistent with either improved governance or managers responding to an increased threat of activism, we find evidence of both a decrease in cash holdings and an increase in the dividend yield. The estimated coefficient on Ln(*Cash*) is negative and statistically significant (Table 12, columns 1-3). The implied magnitudes are large; relative to the sample average, a 10% increase in *Quasi-index* is associated with about an 8% 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 Ln(*Mktcap*) (columns 4–5). Relative to the sample average, a 10% increase in *Quasi-index* is associated with about a 2% increase in firms' dividend yield. These findings are consistent with the earlier findings of Crane, Michenaud, and

[30] 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/.

Weston (2014), which finds an association between *total* institutional ownership and both dividends and cash holdings, using a similar estimation involving the Russell 1000/2000 cutoff.[31]

We find relatively little evidence that ownership by passive investors is associated with corporate policies related to investment or capital structure. We do find some evidence of fewer equity issuances, but this does not appear to translate into a significant difference in firms' overall leverage. The estimated coefficient on *Leverage* is insignificant and economically small. 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 passive investors lack the resources necessary to research and influence corporate policies that are inherently more firm-specific.

VII. Additional robustness checks and choice of specification

In this section, we 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 alternative definitions of passive institutional ownership as our key explanatory variable. We also discuss our choice of specification with respect to other recent papers that have used the construction of the Russell indexes to analyze other questions.

A. Robustness to choice of controls, choice of bandwidth, and placebo tests

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 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.[32]

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 measure *Mktcap* does not affect our findings. This is shown in Appendix Table 6, where we re-estimate our main IV regressions for the period 1998-2006 using the 250 bandwidth with second-order polynomial controls for Ln(*Mktcap*) after replacing the CRSP market cap with the Russell-provided market cap for the years

[31] 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).

[32] According to Russell's documentation, their proprietary 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. Similar to Mullins (2014), we contacted Russell Investments and were only able to obtain a noisy measure their proprietary measure of market capitalizations for the years 2002 through 2006. Russell does not have the data prior to 2002. See Mullins (2014) for more details regarding the likely sources for this noise.

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. We also continue to find a positive association between ROA and passive ownership after controlling for recent movers. 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 7.

Our findings are also robust to controlling for firms' industry, to controlling for whether a firm switched indexes that year, and to controlling for a stock's liquidity. 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 8. 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 9. 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 point estimate for dividend yield, which is no longer statistically significant, all of the findings are robust to the inclusion of these controls. And, as already shown in Section VI.A, the association between ROA and passive ownership is positive and statistically significant when we control for recent moves. Finally, in unreported tests, we find that our estimates are unaffected by the inclusion of additional controls for a stock's liquidity, such as the Amihud measure of illiquidity or a stock's average bid-ask spread.

Our estimates are also robust to our choice of bandwidth around the Russell 1000/2000 threshold. This is shown in Appendix Figure 1, where we plot the point estimates and 95th percentile confidence intervals when varying the bandwidth between 100 and 500 firms and using a first-order polynomial control for *Ln*(*Mktcap*); estimates are reported for both the first stage and IV specifications of Tables 3-12. While the IV estimates are noisier at smaller thresholds, which is when the first stage estimates are also noisier and statistically insignificant, the estimates are relatively similar across the various bandwidths, and there is no evidence to indicate that our findings are sensitive to the choice of bandwidth.

Finally, in further support that our findings are not driven by omitted variables that may be correlated with firms' end-of-May market cap, we do not find an association between passive ownership and our outcomes of interest in placebo IV tests that use alternative thresholds. For example, if we restrict the sample to the top 500 firms of the Russell 2000, and replace our *R2000* indicator with an indicator for the bottom 250 firms of this subsample, our IV estimation does not detect an effect of passive ownership on any of our outcomes. Likewise, we do not find an effect of passive ownership in a similar placebo test that uses the bottom 500 firms of the Russell 1000.

B. Robustness to alternative definitions of passive ownership

An advantage of our identification strategy is that it does not depend on our ability to classify institutional investors. Because the IV estimation only uses variation in institutional ownership that is driven by passive funds attempting to minimize their tracking errors across the two Russell indexes, the exclusion restriction is satisfied when using either total institutional ownership as the key explanatory variable to be instrumented or a narrower measure of passive institutional ownership, as we use in this paper. The interpretation of the local average treatment effect we estimate will remain the same with either measure. We confirm this in unreported tests in which we find qualitatively similar results when using total institutional ownership (rather than quasi-index ownership) as the main explanatory variable.

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 alternative definitions 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 10.[33] In unreported estimates, the findings are also similar if we do not use Bushee's "permanent" classification and instead use the time-varying classifications provided by Bushee or restrict the measure of passive ownership to institutions that are classified as a quasi-indexer in every year of our sample period. These findings provide additional confidence that our earlier estimates are capturing the influence of passive investors and that the IV estimation is not sensitive to how we measure passive ownership.

C. Alternative specification choices

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 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

[33] For our main analysis, however, we prefer to use the broader classification of passive investors that includes all quasi-indexers. Because some passive investors are excluded in the narrower definition, the *R2000* instrumental variable may also affect the outcomes of interest through its effect on the ownership stake of other passive investors.

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.

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.

We do not use the end-of-May market capitalization as an instrument in a fuzzy regression discontinuity, however, because even the market caps provided by Russell (and used in Mullins (2014)), are a weak predictor of index assignment near the cutoff. As can be seen in the top panel of Appendix Figure 2, 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

[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.

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 Appendix Figure 2, which provides a graphical representation of the reduced form version of the fuzzy regression discontinuity estimation. As shown in Appendix Figure 2, 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 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 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.[35]

We also do not use the actual rankings assigned by Russell in a regression discontinuity framework, as done in Boone and White (2014), Crane, Michenaud, and Weston (2014), Lu (2013), and others. 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, which violates the underlying identification assumption of the regression discontinuity (Angrist and Pischke (2009), Lee and Lemieux (2010), Roberts and Whited (2013)). 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 much smaller float-adjusted market cap than firms at the top of the Russell 2000. This is seen in the top half of Appendix Figure 3, 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).

This difference in float-adjusted market cap between firms at the bottom of the Russell 1000 and the top of the Russell 2000 causes these previous papers to overstate the actual impact of index assignment on firms' ownership structure and corporate policies. In particular, these papers are comparing the least liquid stocks of the Russell 1000 index (which active institutions will *endogenously*

[35] 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).

avoid) against the most liquid stocks of the Russell 2000. Moreover, the differences in float-adjusted market cap around the cutoff will mechanically generate an endogenous shift in ownership structure. Stocks at the very bottom of the Russell 1000 are those that have a much smaller float-adjusted market cap relative to their total market cap, and this occurs when large blocks of a firm's equity is held by insiders or other non-financial companies. These endogenous differences in liquidity and inside ownership likely explain why Boone and White (2014), Crane, Michenaud, and Weston (2014), and others argue there is a much larger 10-25 percentage difference in institutional ownership (both active and passive) around the cutoff. Our IV estimation demonstrates that there is only a difference in passive institutional ownership of about 2-4 percentage points, which matches what one would predict based on the amount of money passively tracking each index. Our ability to isolate the exogenous differences in ownership also explains why our findings for corporate policies and managerial pay differ from previous studies of the Russell 1000/2000 cutoff; in particular, we find little evidence of a difference in firms' debt issuances, capital expenditures, R&D expenses, acquisitions, or composition of managerial pay.[36]

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. This lack of focus on passive institutional investors likely stems from a common presumption that passive investors lack both the motives and resources to monitor their large and diverse portfolios. Yet, there are multiple reasons why passive investors may have a vested interest in affecting firms' governance structures and why their ownership stakes might play an important role in firms' policy choices. 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. Economies of scale may also allow passive institutional investors to 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.

To examine whether passive institutions affect firms' governance, and if so, by which mechanisms, we exploit variation in passive institutional ownership that occurs around the cutoff used to construct the Russell 1000 and Russell 2000 indexes. 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

[36] 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 3.

assigned to the Russell 2000 in a given year and analyze the influence of passive investors in an economically important sample of large U.S. publicly listed firms. 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. The observed differences in actual governance structures suggests that passive institutions may be more attentive to firms' governance structures than the retail investors they displace, and that they use their large voting blocs to exert influence. For example, we find that higher passive institutional ownership is associated with less support for management proposals and a greater support for shareholder-initiated governance proposals. While we do not find direct evidence that the concentrated ownership of passive investors facilitates activism by other, non-passive investors, it is possible that managers and boards are particularly sensitive to the views of passive investors because their presence (and potential dissatisfaction) increases the threat of activism by other investors.

The growing influence of passive investors appears, on average, to have a positive impact on long-term firm-level performance and value. If we add controls for firms that switch indexes during reconstitution, so as to better isolate the longer-term impact of passive ownership, we find evidence that, on average, greater passive ownership is associated with an improvement in performance. We also find that passive ownership is associated with a decrease in firms' cash holdings, an increase in dividends, and a suggestive decline in managerial compensation. These findings are consistent with the observed differences in governance having a positive influence on firm value.

Our findings, however, do not resolve the ongoing debate regarding the value implications of various governance structures, including board independence, antitakeover defenses, and equal voting rights for shareholders, and whether the optimal governance structure may vary across firms in ways that do not always conform to the proxy-voting guidelines of the largest passive institutions. The findings also do not address whether passive investors attempt to determine the individual governance needs of each company in their large portfolios or instead follow a "check the box" approach to governance. While some large passive investors do vary their voting strategies across firms in ways that are not consistent with such a one-size-fits-all approach to governance (e.g., see Davis and Han, (2007)), additional analysis regarding these questions would seem to be a promising direction for further research.

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. Securities[37]

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

[37] http://www.blackrock.com/corporate/en-us/literature/fact-sheet/blk-responsible-investment-guidelines-us.pdf

B. Dimensional Fund Advisors: Prospectus (Statement of Additional Information)[38]

- 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[39]

- 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.

- 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

[38] http://us.dimensional.com/media/documents/downloads/pub/pdf/sai/idg_equity_i_sai.pdf
[39] http://www.ssga.com/library/capb/713689_Proxy_Voting_and_Engagement_Guidelines_US_1_CCRI1396595054 .pdf

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 Guidelines[40]

- 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. 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

[40] https://about.vanguard.com/vanguard-proxy-voting/voting-guidelines/

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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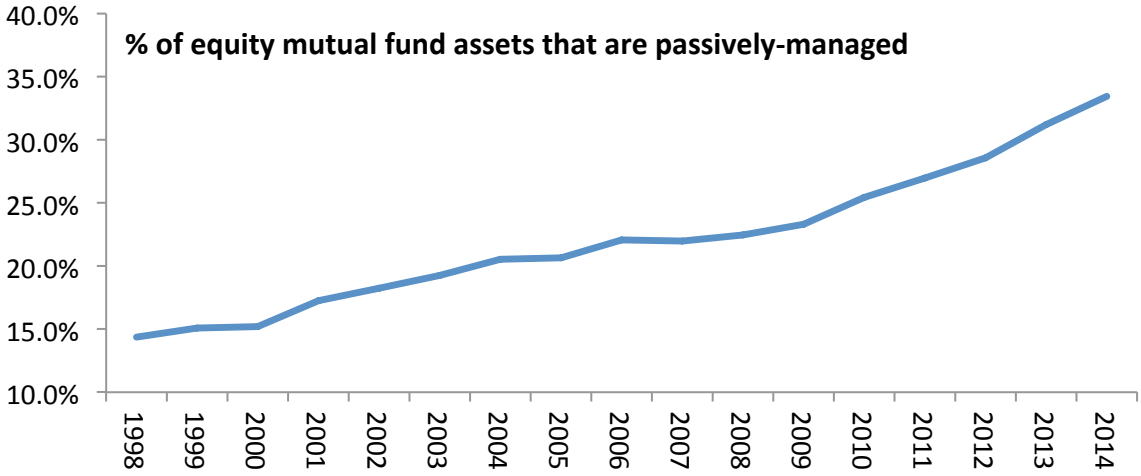


Figure 1

Growth of passive investors, 1998-2014 This figure plots the estimated percent of all U.S. equity mutual fund assets under management between 1998 and 2014 that are held in indexed or passively-managed funds. Total net assets for each mutual fund are obtained from the CRSP mutual fund file, and to classify which mutual funds are passively-managed, we extend the mutual fund name-parsing technique that was used in Iliev and Lowry (2014). In particular, we augment their original list of strings used to identify passive funds to also include strings such as 500, 1000, 2000, iShares, Vanguard, State Street, DFA, and Dimensional.

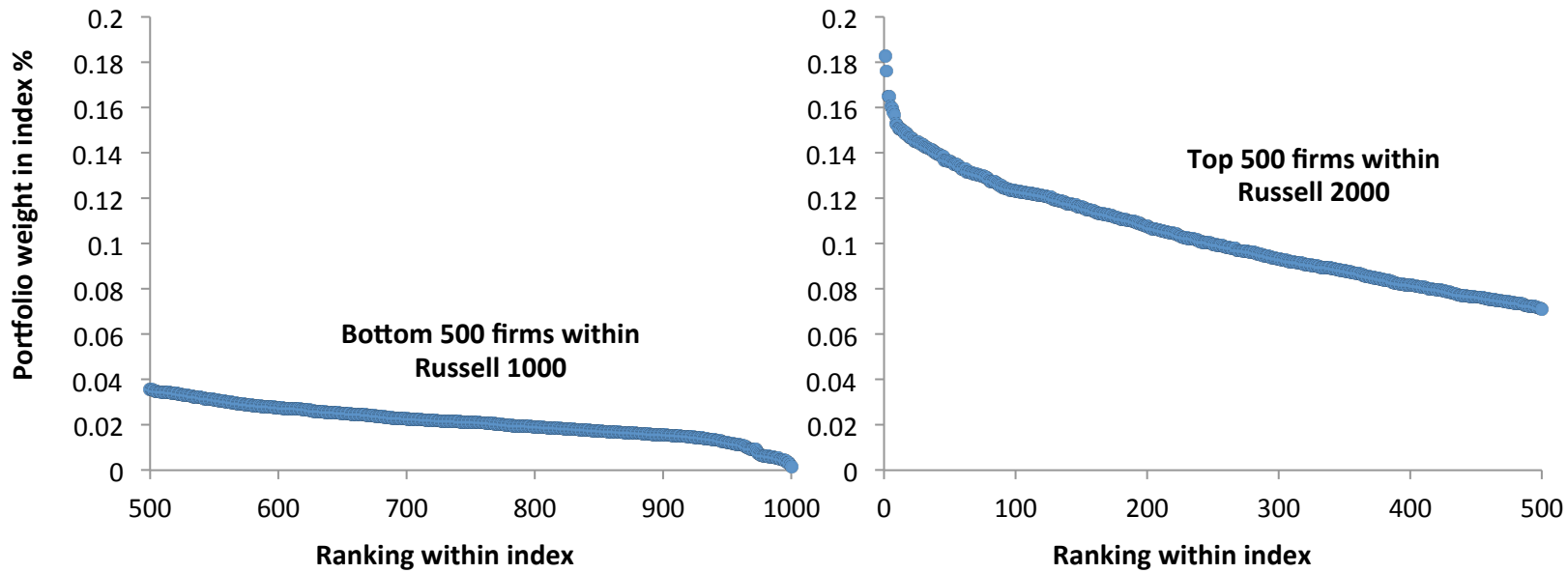


Figure 2
Portfolio weights in the Russell 1000 and 2000 indices by within-index ranking for the year 2006
This figure plots the portfolio weights of the bottom 500 firms in the Russell 1000 index and the top 500 firms in the Russell 2000 index for the end-of-June 2006. Observations are ordered by their 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.

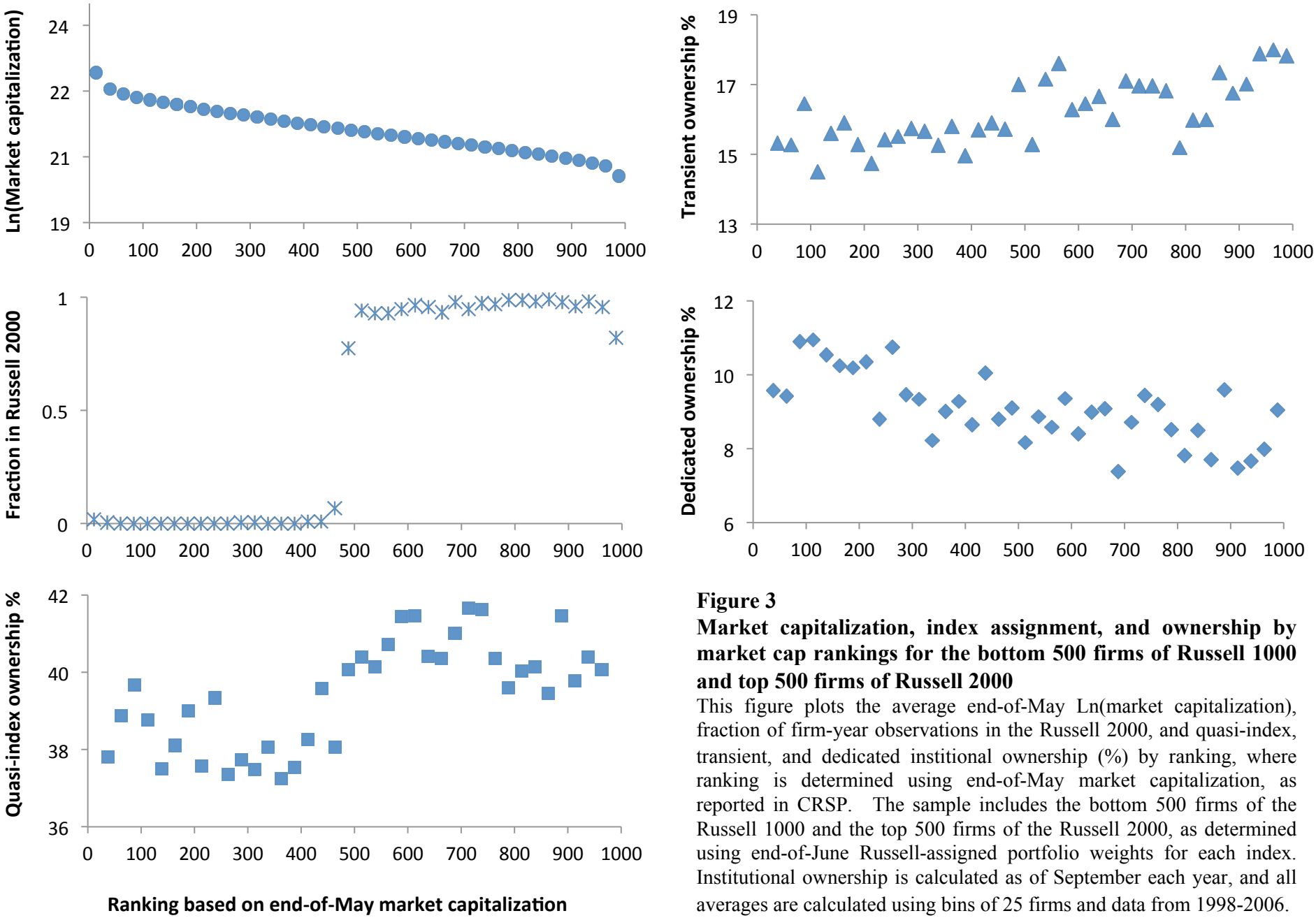


Figure 3
Market capitalization, index assignment, and ownership by market cap rankings for the bottom 500 firms of Russell 1000 and top 500 firms of Russell 2000

This figure plots the average end-of-May Ln(market capitalization), fraction of firm-year observations in the Russell 2000, and quasi-index, transient, and dedicated institional ownership (%) by ranking, where ranking is determined using end-of-May market capitalization, as reported in CRSP. The sample includes the bottom 500 firms of the Russell 1000 and the top 500 firms of the Russell 2000, as determined using end-of-June Russell-assigned portfolio weights for each index. Institutional ownership is calculated as of September each year, and all averages are calculated using bins of 25 firms and data from 1998-2006.

Table 1
Summary statistics

This table reports summary statistics for our key variables. Summary statistics are reported separately for our two main 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**
Institutional ownership %	8,268	64.5	68.3	22.2	4,105	63.6	67.8	23.2
Quasi-index %	8,268	39.1	39.7	15.3	4,105	38.3	39.3	16.1
Dedicated %	8,268	9.2	7.15	9.1	4,105	9.2	6.9	9.7
Transient %	8,268	16.1	14.2	10.7	4,105	16.0	14.2	10.7
Independent director %	5,604	65.3	66.7	17.9	2,685	64.9	66.7	18.2
Poison pill removal	5,472	0.04	0	0.19	2,708	0.04	0	0.18
Greater ability to call special meeting	3,552	0.006	0	0.07	1,740	0.007	0	0.08
Indicator for dual class shares	3,552	0.12	0	0.32	1,740	0.12	0	0.33
Mngt. proposal support %	2,485	84.9	87.9	12.0	1,219	85.0	87.5	11.8
Shareholder gov. proposal support %	408	39.2	38.0	23.7	190	35.9	31.5	22.5
Indicator for hedge fund activism	8,268	0.014	0	0.12	4,105	0.014	0	0.12
ROA	8,061	0.03	0.04	0.11	3,998	0.03	0.04	0.11
Ln(Cash)	8,019	4.53	4.72	1.51	3,983	4.51	4.72	1.49
Dividend yield	8,011	0.149	0.003	0.03	3,976	0.144	0.002	0.03
Ln(Total CEO pay)	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

$$IO_{it} = \eta + \lambda R2000_{it} + \sum_{n=1}^{N} \chi_n \left(Ln(Mktcap_{it}) \right)^n + \sigma Ln(Float)_{it} + \delta_t + u_{it}$$

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.

Dependent variable =	**Percent of firm's common shares held by:**			
	All institutions	**Quasi-index**	**Dedicated**	**Transient**
	(1)	(2)	(3)	(4)
R2000	1.974*	2.756***	-0.742	0.013
	(1.068)	(0.661)	(0.609)	(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

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

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. $Quasi\text{-}index_{it}$ 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.

Dependent variable =	**Quasi-index %**					
	(1)	(2)	(3)	(4)	(5)	(6)
R2000	3.820***	3.974***	2.756***	3.006***	2.999***	2.041***
	(0.637)	(0.630)	(0.661)	(0.715)	(0.701)	(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 used to identify the effect of institutional ownership by passive investors on the percentage of independent board directors. Specifically, we estimate

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

where Y_{it} is the percentage of independent directors on the board of firm i in year t (from Riskmetrics), $Quasi\text{-}index_{it}$ 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 Ln(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.

Dependent variable =	**Independent director %**					
	(1)	(2)	(3)	(4)	(5)	(6)
Quasi-index %	0.885**	0.941***	0.771**	1.415***	1.579***	1.407***
	(0.347)	(0.360)	(0.381)	(0.416)	(0.459)	(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

Passive ownership and independent directors, pre- versus post-2002 exchange rule change

This table reports estimates of the second-stage regression of our instrumental variable estimation used to identify the effect of institutional ownership by passive investors on the percentage of independent board directors both before and after the 2002 change in exchange-listing requirements regarding board independence. The estimation is the same as in Table 4, except we now separately estimate the model over the 1998-2002 and 2003-2006 time periods using a bandwidth of 250 firms around the Russell 1000/2000 threshold, and polynomial order controls for Ln(*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.

Dependent variable =	**Independent director %**					
	Sample years = 1998-2002			***Sample years = 2003-2006***		
	(1)	(2)	(3)	(4)	(5)	(6)
Quasi-index %	2.270**	2.720**	2.484**	0.778**	0.774**	0.738
	(0.887)	(1.162)	(1.262)	(0.333)	(0.384)	(0.491)
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	858	858	858	502	502	502
Observations	1,616	1,616	1,616	1,069	1,069	1,069

Table 6

Ownership by passive investors and takeover defenses

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

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

where Y_{it} is the governance variable for firm i in year t, $Quasi\text{-}index_{it}$ 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, and an indicator for there being fewer restrictions on shareholders' ability to call a special meeting 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 Ln(Mktcap). Standard errors, ε, are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable =	**Poison pill removal**			**Greater ability to call special meeting**		
	(1)	(2)	(3)	(4)	(5)	(6)
Quasi-index %	0.005*	0.006*	0.011	0.005**	0.005*	0.006*
	(0.003)	(0.003)	(0.008)	(0.002)	(0.003)	(0.003)
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	1,087	1,087	1,087	1,000	1,000	1,000
Observations	2,708	2,708	2,708	1,740	1,740	1,740

Table 7
Ownership by passive investors and dual class shares

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

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

where Y_{it} is an indicator equal to 1 if firm i has dual class shares in year t according to Riskmetrics, $Quasi\text{-}index_{it}$ 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 order controls for Ln(Mktcap) of N = 1, 2, and 3. Standard errors, ε, are clustered at the firm level. The symbol ** indicates significance at the 5% level.

Dependent variable =	**Indicator for dual class shares**		
	(1)	(2)	(3)
Quasi-index %	-0.047**	-0.064**	-0.066**
	(0.019)	(0.027)	(0.031)
Bandwidth	250	250	250
Polynomial order, N	1	2	3
Float control	yes	yes	yes
Year fixed effects	yes	yes	yes
# of firms	1,000	1,000	1,000
Observations	1,740	1,740	1,740

Table 8
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

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

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), $Quasi\text{-}index_{it}$ 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 order controls for Ln(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.

Dependent variable =	**Management proposal support %**			**Governance proposal support %**		
	(1)	(2)	(3)	(4)	(5)	(6)
Quasi-index %	-0.871***	-0.862***	-1.002*	0.872**	1.111	1.253
	(0.296)	(0.296)	(0.513)	(0.443)	(0.679)	(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	751	751	751	122	122	122
Observations	1,219	1,219	1,219	190	190	190

Table 9

Ownership by passive investors and hedge fund activism

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

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

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), Q*uasi-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 Q*uasi-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 Ln(Mktcap) of N = 1, 2, and 3. Standard errors, ε, are clustered at the firm level.

Dependent variable =	**Indicator for hedge fund activism event**		
	(1)	(2)	(3)
Quasi-index %	-0.0026	-0.0026	-0.0044
	(0.0016)	(0.0016)	(0.0029)
Bandwidth	250	250	250
Polynomial order, N	1	2	3
Float control	yes	yes	yes
Year fixed effects	yes	yes	yes
# of firms	1,566	1,566	1,566
Observations	4,105	4,105	4,105

Table 10

Ownership by passive investors and firms' return on assets

This table reports estimates of the second-stage regression of our instrumental variable estimation used to identify the effect of institutional ownership by passive investors on firms' performance, as measured using firms' return on assets (ROA). Specifically, we estimate

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

where Y_{it} is the ROA for firm i in year t, $Quasi\text{-}index_{it}$ 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 specification in columns (1)-(3) are the same as in earlier tables, but in columns (4)-(6), we add 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 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 Ln(Mktcap). Standard errors, ε, are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable =	**ROA**					
	(1)	(2)	(3)	(4)	(5)	(6)
Quasi-index %	-0.0007	-0.0003	0.0006	0.0058**	0.0061**	0.0121*
	(0.0020)	(0.0018)	(0.0027)	(0.0026)	(0.0025)	(0.0064)
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
Controls for recent movers	no	no	no	yes	yes	yes
# of firms	1,520	1,520	1,520	1,520	1,520	1,520
Observations	3,998	3,998	3,998	3,998	3,998	3,998

Table 11
Ownership by passive investors and CEO compensation

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

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

where Y_{it} is the log of total CEO compensation for firm i in year t (from Execucomp), $Quasi\text{-}index_{it}$ 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 Ln(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.

Dependent variable =	**Ln(CEO total pay)**					
	(1)	(2)	(3)	(4)	(5)	(6)
Quasi-index %	-0.046*	-0.042**	-0.051	-0.025	-0.022	-0.062
	(0.024)	(0.021)	(0.031)	(0.037)	(0.033)	(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

Table 12
Ownership by passive investors, cash holdings, and dividend policy

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

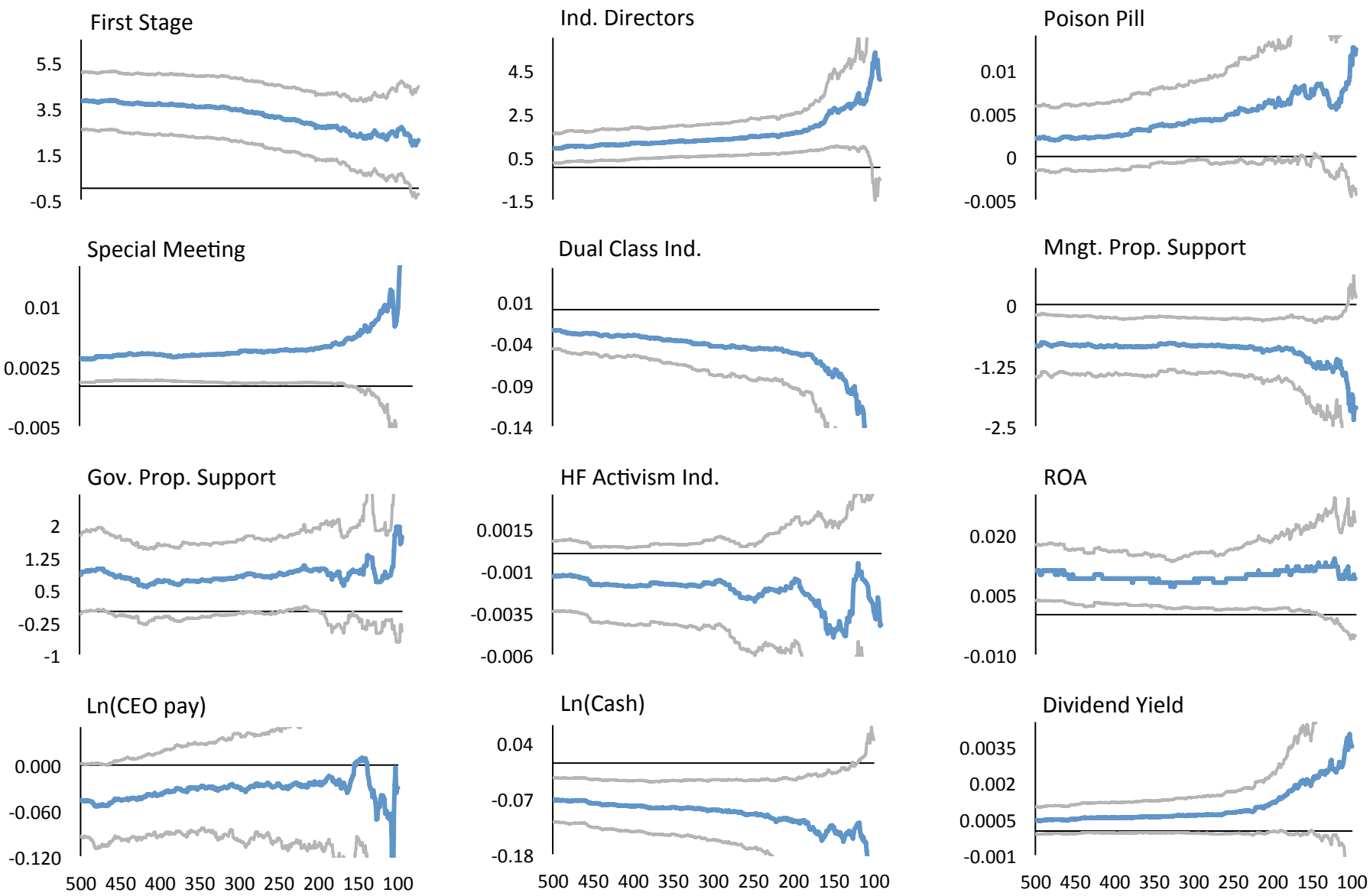
$$Y_{it} = \alpha + \beta Quasi\text{-}index_{it} + \sum_{n=1}^{N} \theta_n \left(Ln(Mktcap_{it})\right)^n + \gamma Ln(Float)_{it} + \delta_t + \varepsilon_{it}$$

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); $Quasi\text{-}index_{it}$ 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 Ln(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.

Dependent variable =	**Ln(cash)**			**Dividend yield**		
	(1)	(2)	(3)	(4)	(5)	(6)
Quasi-index %	-0.101***	-0.100***	-0.100*	0.0008*	0.0008*	0.0010
	(0.028)	(0.027)	(0.046)	(0.0004)	(0.0004)	(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

Internet Appendix for
"Passive Investors, Not Passive Owners"

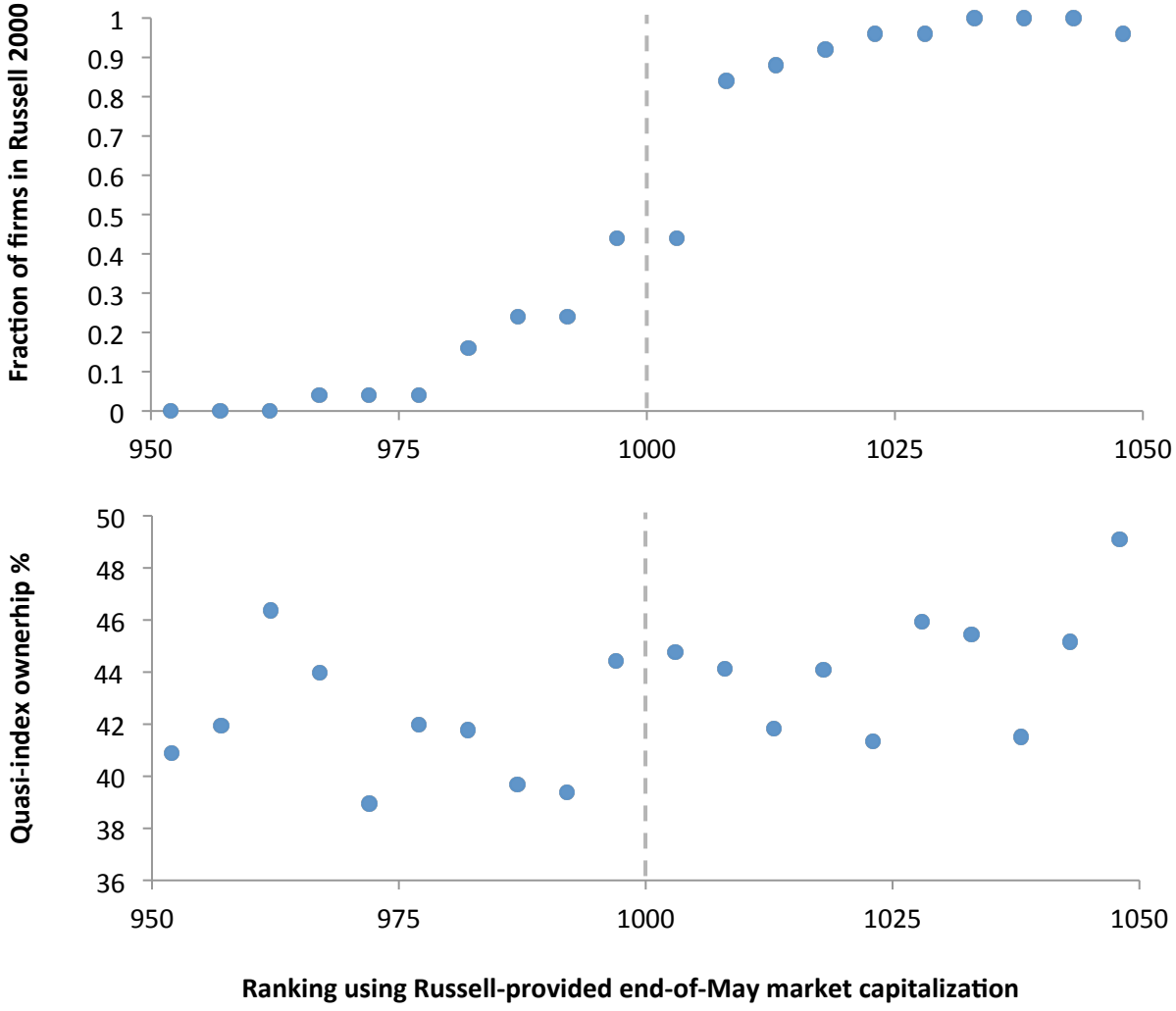
June 1, 2015



Appendix Figure 1

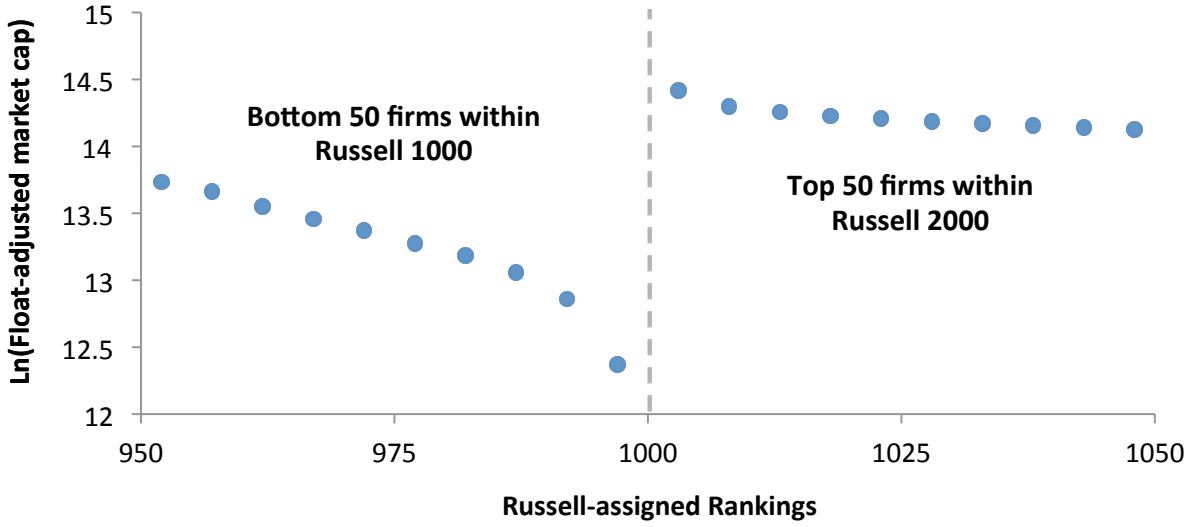
First stage and IV point estimates in the 100 through 500 bandwidths around Russell 1000/2000 threshold

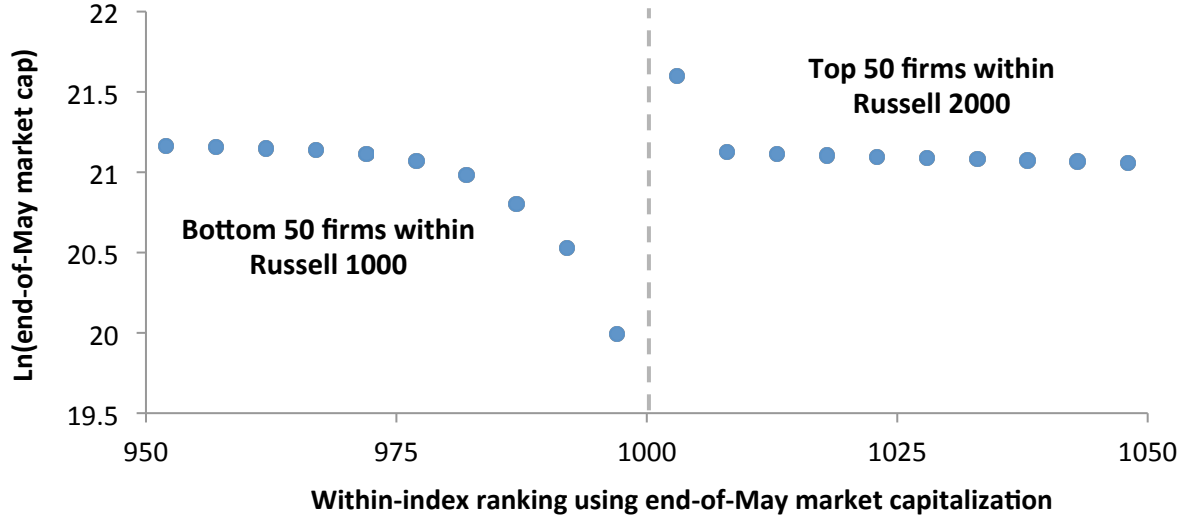
This figure plots the point estimate and 95th percentile confidence intervals by bandwidth choice for the outcomes reported in Tables 3-12. The first stage and IV estimations are the same as in Tables 3-9, 11, 12 and columns 4-6 of Table 10 except the bandwidth is varied between 100 and 500 firms around the Russell 1000/2000 threshold. A first-order polynomial control for Ln(*Mktcap*) is also included in all estimations.



Appendix Figure 2
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.





Appendix Figure 3
Average Ln(*Float*) and Ln(*Mktcap*) by ranking, where ranking is calculated using either float-adjusted portfolio weights assigned by Russell or within-index rankings based on end-of-May market capitalizations

The top panel of this figure plots the average Ln(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. The bottom panel of this figure plots the average Ln(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
R2000	Russell Investments	Indicator equal to 1 if firm is in the Russell 2000
Institutional ownership %	Thomson/CDA 13F files	% of shares outstanding held by institutional investors in September of year *t*
Quasi-index %	Brian Bushee website	% of shares outstanding held by quasi-indexer institutions in September of year *t*
Dedicated %	Brian Bushee website	% of shares outstanding held by dedicated insitutions in September of year *t*
Transient %	Brian Bushee website	% of shares outstanding held by transient insitutions in September of year *t*
Independent director %	Riskmetrics (Directors)	% of board seats held by directors classified as independent by Riskmetrics
Poison pill removal	Shark Repellent (FactSet)	Indicator equal to 1 if poison pill is withdrawn or allowed to expire at time *t*
Greater ability to call spec. meet.	Riskmetrics (Governance)	Indicator equal to 1 if shareholders better able to call a special meeting at time *t*
Indicator for dual class shares	Riskmetrics (Governance)	Indicator equal to 1 if a firm has dual class shares at time *t*
Mngt. proposal support %	Riskmetrics (Voting Results)	Percentage of 'Yes" votes for management proposals
Shareholder gov. prop. support %	Riskmetrics (Voting Results)	Percentage of 'Yes" votes for sharehold governance proposals
Indicator for hedge fund activism	Brav, Jiang, and Kim (2010)	Indicator equal to 1 if a firm has an activism event at time *t*
ROA	Compustat	Net income (*ni*) / total assets (*at*)
Ln(Cash)	Compustat	Ln(Cash and short term securities (*che*))
Dividend yield	Compustat	Common dividends (*dvc*) normalized by market value of equity (*prcc_f*csho*)
Ln(Total CEO pay)	Execucomp	Ln(Total CEO compensation (*tdc1*))

Appendix Table 2
OLS estimates for Tables 4-12

This table reports estimates of the OLS regression of various governance and corporate outcome variables onto quasi-index institutional ownership. Specifically, we estimate

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

where: Y_{it} is the outcome variable for firm *i* in year *t*; *Quasi-index*$_{it}$ is the percentage of shares outstanding owned by quasi-index institutional investors (as defined in Bushee (2001)) 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 Tables 4-12. 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 Ln(Mktcap). The estimates are qualitatively similar when using other bandwidths or first- or third-order polynomial controls 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.

Dep. variable =	**Ind. directors %**	**Poison pill removal**	**Ability to call special meeting**	**Ind. for dual class shares**	**Mngt. proposal support %**	**Gov. proposal support %**	**HF activism event**	**ROA**	**Ln(cash)**	**Dividend yield**	**Ln(Total CEO pay)**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Quasi-index %	0.096**	-1E-05	-0.0001	0.0006	-0.070***	0.492***	0.00016	0.001***	-0.016***	-0.0002***	0.0035**
	(0.043)	(0.0002)	(0.0001)	(0.0007)	(0.026)	(0.139)	(0.0001)	(0.0002)	(0.003)	(0.00004)	(0.0017)
Bandwidth	250	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	1,037	1,087	1,000	1,000	758	122	1,566	1,520	1,516	1,514	996
Observations	2,685	2,708	1,740	1,740	1,219	190	4,105	3,998	3,983	3,976	2,657

Appendix Table 3
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*.

Dependent variable =	**Transient %**					
	(1)	(2)	(3)	(4)	(5)	(6)
R2000	0.421	0.363	0.013	0.475	0.257	0.259
	(0.495)	(0.493)	(0.501)	(0.572)	(0.570)	(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 4
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*.

Dependent variable =	**Dedicated %**					
	(1)	(2)	(3)	(4)	(5)	(6)
R2000	-0.757	-0.837	-0.742	-0.750	-0.851	-0.743
	(0.602)	(0.570)	(0.609)	(0.768)	(0.700)	(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 5A
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.

Dependent variable =	**Quasi-index %**					
	(1)	(2)	(3)	(4)	(5)	(6)
R2000	3.668***	3.552***	3.279***	3.892***	3.663***	3.380***
	(0.752)	(0.762)	(0.758)	(0.888)	(0.930)	(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 5B
First-stage estimation for Tables 6 & 7

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 Tables 6 and 7. *** indicates significance at the 1% level; ** indicates significance at the 5% level; * indicates significance at the 10% level.

Dependent variable =	**Quasi-index %**					
	(1)	(2)	(3)	(4)	(5)	(6)
R2000	3.207***	3.160***	1.735*	3.262***	2.824**	2.556**
	(0.892)	(0.843)	(0.967)	(1.094)	(1.124)	(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 6, Column (1)	Table 6, Column (2)	Table 6, Column (3)	Table 6, Column (4) & Table 7, Column (1)	Table 6, Column (5) & Table 7, Column (2)	Table 6, Column (6) & Table 7, Column (3)
# 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 5C
First-stage estimation for Table 8

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-intitiated governance proposals. Specifically, these are the first-stage estimates for the IV estimates reported in Table 8. *** indicates significance at the 1% level; ** indicates significance at the 5% level.

Dependent variable =	**Quasi-index %**					
	(1)	(2)	(3)	(4)	(5)	(6)
R2000	4.242***	4.209***	3.111**	8.554***	6.894**	6.537**
	(1.138)	(1.136)	(1.297)	(2.787)	(3.174)	(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 8, Column (1)	Table 8, Column (2)	Table 8, Column (3)	Table 8, Column (4)	Table 8, Column (5)	Table 8, Column (6)
# of firms	758	758	758	122	122	122
Observations	1,219	1,219	1,219	190	190	190
R-squared	0.20	0.20	0.21	0.20	0.21	0.21

Appendix Table 5D
First-stage estimation for Table 11

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 11. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable =	**Quasi-index %**					
	(1)	(2)	(3)	(4)	(5)	(6)
R2000	2.443***	2.682***	2.062***	1.732*	1.912**	1.221
	(0.740)	(0.725)	(0.776)	(1.004)	(0.944)	(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 11, Column (1)	Table 11, Column (2)	Table 11, Column (3)	Table 11, Column (4)	Table 11, Column (5)	Table 11, 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 6
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 4-12, 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*). To demonstrate the robustness of the association between passive ownership and longer-term performance, we include the additional controls for recent movers, used in columns 4-6 of Table 10, when analyzing *ROA* (column 8). Standard errors, ε, are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dep. variable =	**Ind. directors %**	**Poison pill removal**	**Ability to call special meeting**	**Ind. for dual class shares**	**Mngt. proposal support %**	**Gov. proposal support %**	**HF activism event**	**ROA**	**Ln(cash)**	**Dividend yield**	**Ln(total CEO pay)**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Quasi-index %	1.329***	0.005	0.005**	-0.027**	-0.825***	0.724	-0.003*	0.007***	-0.088***	0.001*	-0.008
	(0.391)	(0.003)	(0.002)	(0.012)	(0.288)	(0.776)	(0.002)	(0.003)	(0.028)	(0.0004)	(0.024)
Bandwidth	250	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	1,037	1087	1000	1,000	758	122	1,566	1,520	1,516	1,514	996
Observations	2,685	2,708	1,740	1,740	1219	190	4,105	3,998	3,983	3,976	2,657

Appendix Table 7
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 4-12, 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*). To demonstrate the robustness of the association between passive ownership and longer-term performance, we include the additional controls for recent movers, used in columns 4-6 of Table 10, when analyzing *ROA* (column 8). Standard errors, ε, are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable =	**Ind. directors %**	**Poison pill removal**	**Ability to call special meeting**	**Ind. for dual class shares**	**Mngt. proposal support %**	**Gov. proposal support %**	**HF activism event**	**ROA**	**Ln(cash)**	**Dividend yield**	**Ln(CEO pay)**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Quasi-index %	1.765***	0.005**	0.004**	-0.064***	-0.898***	1.139*	-0.0022	0.005**	-0.090***	0.0008**	-0.012
	(0.457)	(0.002)	(0.002)	(0.0209)	(0.295)	(0.610)	(0.0014)	(0.002)	(0.027)	(0.000)	(0.030)
Bandwidth	250	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	983	1,016	943	943	711	115	1,470	1,425	1,422	1,419	939
Observations	2,562	2,536	1,652	1,652	1,159	181	3,887	3,785	3,773	3,763	2,523

Appendix Table 8
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 4-12 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*). To demonstrate the robustness of the association between passive ownership and longer-term performance, we include the additional controls for recent movers, used in columns 4-6 of Table 10, when analyzing *ROA* (column 8). Standard errors, ε, are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable =	**Ind. directors %**	**Poison pill removal**	**Ability to call special meeting**	**Ind. for dual class shares**	**Mngt. proposal support %**	**Gov. proposal support %**	**HF activism event**	**ROA**	**Ln(cash)**	**Dividend yield**	**Ln(Total CEO pay)**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Quasi-index %	1.182***	0.005*	0.005**	-0.044**	-0.858***	0.734	-0.0026	-0.001	-0.099***	0.0002	-0.001
	(0.333)	(0.003)	(0.002)	(0.018)	(0.312)	(0.607)	(0.0016)	(0.002)	(0.028)	(0.0002)	(0.024)
Bandwidth	250	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
2-digit industry FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	1,037	1,087	1,000	1,000	758	122	1,566	1,520	1,516	1,514	996
Observations	2,685	2,708	1,740	1,740	1,219	190	4,105	3,998	3,983	3,976	2,657

Appendix Table 9
Robustness of findings to including controls for firms that recently switched 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 recently switched indexes. Specifically, the data, outcome variables, and specification are the same as in Tables 4-12 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.

Dependent variable =	**Ind. directors %**	**Poison pill removal**	**Ability to call special meeting**	**Ind. for dual class shares**	**Mngt. proposal support %**	**Gov. proposal support %**	**HF activism event**	**ROA**	**Ln(cash)**	**Dividend yield**	**Ln(Total CEO pay)**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Quasi-index %	1.315***	0.005*	0.003**	-0.052***	-1.319**	1.306**	-0.0047**	0.006**	-0.149***	0.0004	-0.037
	(0.445)	(0.003)	(0.002)	(0.016)	(0.548)	(0.651)	(0.0023)	(0.003)	(0.0486)	(0.0005)	(0.052)
Bandwidth	250	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Controls for recent movers	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	1,037	1087	1000	1,000	751	122	1,566	1,520	1,516	1,514	996
Observations	2,685	2,708	1,740	1,740	1,219	190	4,105	3,998	3,983	3,976	2,657

Appendix Table 10
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 by Vanguard, State Street, and Barclays Bank on our governance and corporate outcome variables. Specifically, we estimate

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

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 Ln(Mktcap). To demonstrate the robustness of the association between passive ownership and longer-term performance, we include the additional controls for recent movers, used in columns 4-6 of Table 10, when analyzing ROA (column 8). Standard errors, ε, are clustered at the firm level. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable =	**Ind. directors %**	**Poison pill removal**	**Ability to call special meeting**	**Ind. for dual class shares**	**Mngt. proposal support %**	**Gov. proposal support %**	**HF activism event**	**ROA**	**Ln(cash)**	**Dividend yield**	**Ln(Total CEO pay)**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Passive %	4.371***	0.009**	0.011***	-0.130***	-3.064***	1.110	-0.006*	0.014***	-0.224***	0.002**	-0.037
	(0.954)	(0.004)	(0.004)	(0.025)	(0.794)	(3.162)	(0.0031)	(0.005)	(0.065)	(0.001)	(0.053)
Bandwidth	250	250	250	250	250	250	250	250	250	250	250
Polynomial order, N	2	2	2	2	2	2	2	2	2	2	2
Float control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# of firms	1,037	1,087	1,000	1,000	758	122	1,566	1,520	1,516	1,514	996
Observations	2,685	2,708	1,740	1,740	1,219	190	4,105	3,998	3,983	3,976	2,657