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Passive investors, not passive owners☆

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ABSTRACT

Passive institutional investors are an increasingly important component of U.S. stock ownership. To examine whether and by which mechanisms passive investors influence firms' governance, we exploit variation in ownership by passive mutual funds associated with stock assignments to the Russell 1000 and 2000 indexes. Our findings suggest that passive mutual funds influence firms' governance choices, resulting in more independent directors, removal of takeover defenses, and more equal voting rights. Passive investors appear to exert influence through their large voting blocs, and consistent with the observed governance differences increasing firm value, passive ownership is associated with improvements in firms' longer-term performance.

"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

1. Introduction

While there is considerable evidence that institutional investors influence the governance and policies of firms (e.g., Aghion, Van Reenen, and Zingales, 2013; Brav, Jiang, Partnoy, and Thomas, 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,

% of equity mutual fund assets that are passively managed
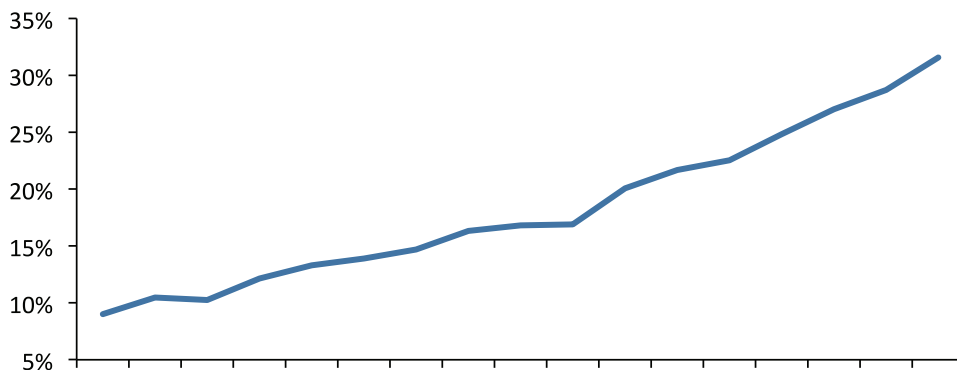
% of total market cap held by passively managed funds
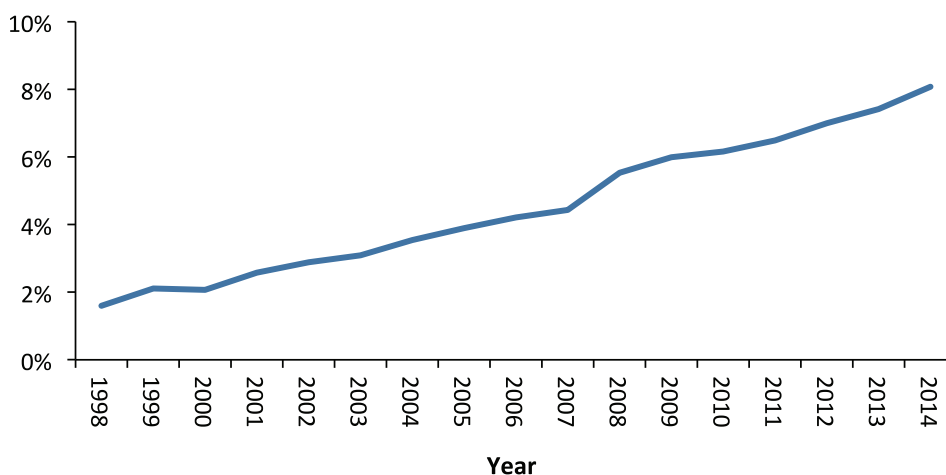
Fig. 1. Growth of passive investors, 1998–2014. This figure plots the estimated percent of all U.S. equity mutual fund assets under management between 1998 and 2014 that are held in passively managed funds and the estimated percent of total U.S. market capitalization held by passively managed mutual funds. We construct the figure by matching the S12 mutual fund holdings data compiled in the Thomson Reuters Mutual Fund Holdings Database to market caps reported in CRSP and fund names in the CRSP Mutual Fund Database. We use a name-parsing procedure along with the index fund identifier from the CRSP Mutual Fund Database to classify mutual funds as passively managed. Our procedure is described in Section 2.1 of the text. Holdings and market cap are calculated each year at the end of the third quarter.

such active investors represent only a subset of institutions. Many institutions are instead passive in that they do not actively buy or sell shares to influence managerial decisions. The investment objective of such institutions is to deliver the returns of a market index (e.g., Standard & Poors (S&P) 500) or investment style (e.g., large-cap value) with low turnover, diversified portfolios, and minimal expenses. As shown in Fig. 1, passive investors have grown significantly in recent years; the share of equity mutual fund assets held in passively managed funds tripled over the 1998–2014 period to 33.5%, and the share of total U.S. market capitalization held by passively managed funds quadrupled to more than 8%. However, the growth of passive investors raises questions about how effectively managers are being monitored. Some worry that passive investors lack the motives and resources to monitor their large, diverse portfolios, and that the increasing market share of such "lazy investors" weakens firm-level gover-

nance and hurts performance.[3] Others counter that passive investing does not equate with passive ownership.[4] In this

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[3] An example of this viewpoint was expressed in *The Economist (2015)* on February 7. As it stated, "A rising chunk of the stock market sits in the hands of lazy investors. Index funds and exchange-traded funds mimic the market's movements, and typically take little interest in how firms are run; conventional mutual funds and pension funds that oversee diversified portfolios dislike becoming deeply involved in firms' management."

[4] 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 cofounder of Dimensional Fund Advisors, in the *New York Times* on March

paper, we examine whether passive institutional investors influence firms' governance structures, and ultimately, performance.

There are various arguments for why the growth of passive investors could weaken the governance and performance of firms. First, such institutional investors might lack an incentive to monitor managers. In particular, passive funds seek to deliver the performance of the benchmark, and unlike actively managed funds, they have little motive to improve an individual stock's performance. Second, passive investors might be less able to exert influence over managers. By seeking to minimize deviations from the underlying index weights, passive institutions tend to lack a traditional lever used by non-passive investors to influence managers—the ability to accumulate or exit positions. Third, given their diversified holdings, passive investors might have insufficient resources to research and monitor the corporate policies of each individual firm in their portfolio.

And yet, there are numerous reasons why the growth of passive investors might improve firms' governance choices and performance. First, passive institutions might be motivated to monitor managers and improve overall market performance because this increases the value of their assets under management (Del Guercio and Hawkins, 1999). Moreover, because passive institutions are less willing to divest their positions in poorly performing stocks, they might be more motivated than other institutions to be engaged owners (Romano, 1993; Carleton, Nelson, and Weisbach, 1998). Second, institutions that manage passive funds can use their sizable ownership stakes to wield influence. All institutional investors have a fiduciary duty to vote their proxies in the best interest of shareholders, and managers might be more inclined to consider the views of passive investors over more active investors, which tend to exhibit higher turnover rates (Del Guercio and Hawkins, 1999). Finally, while passive institutions might lack the resources necessary to monitor the detailed policy choices of every firm in their large, diversified portfolios, they might be effective at engaging in widespread, but low-cost, monitoring of firms' compliance with what they consider to be best governance practices (e.g., Black, 1992, 1998).

Identifying the impact of passive investors on firms' corporate governance and performance can be challenging. 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 managerial decisions.

To overcome this challenge and to assess whether passive investors affect firms' governance and performance, we exploit variation in ownership by passive mutual funds that occurs around the cutoff point used to construct two widely used market benchmarks, the Russell 1000 and Russell 2000 indexes. The Russell 1000 comprises the largest 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 passive ownership. For example, the 750th through 1,000th largest stocks will be included in the Russell 1000 and be given small portfolio weights 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.

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. We find that the ownership by passively managed mutual funds is, on average, about 66% 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 three of the biggest passive investors, 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 increases by two-thirds on average, while their likelihood of being a top five shareholder is higher, on average, by 15%. We find *no* corresponding difference in ownership of stocks around the cutoff by actively managed mutual funds.

Exploiting this variation in ownership around the Russell 1000/2000 cutoff in an instrumental variable (IV) estimation, we assess the effect of passive funds on firms' governance structures and performance. Specifically, we instrument for ownership by passive funds 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, inclusion in the Russell 2000 index does not directly affect our outcomes of interest except through its impact on passive ownership. This assumption seems reasonable in our setting in that it is unclear why index inclusion would be directly related to governance and corporate performance after restricting the sample to stocks near the Russell 1000/2000 cutoff and after controlling for the factor that determines index inclusion—stocks' end-of-May market capitalization.

The three broad governance outcomes we analyze reflect those highlighted in a recent speech by the Chief Executive Officer (CEO) of Vanguard (see McNabb, 2014) and the historical proxy-voting policies of the largest passive institutional investors. While passive institutions do vary their voting strategy across firms on governance

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16, 2013 (Sommer, 2013) in an article titled, "Challenging management (but not the market)."

issues (e.g., see Davis and Kim, 2007), three common themes of their historical proxy-voting policies were (1) to support greater board independence, (2) oppose anti-takeover provisions, and (3) oppose unequal voting rights, as occurs when firms maintain a dual class share structure (e.g., see McNabb, 2014 and the Appendix for more details on voting guidelines of three prominent passive institutional investors). We also analyze vote outcomes, such as the average support for management and governance-related shareholder proposals, which could be directly related to a potential mechanism by which passive investors can exert influence—their ability to exercise "voice."

Using our IV approach, we find that passive mutual funds have a significant impact on each of the three aspects of governance. First, an increase in ownership by passive funds is associated with an increase in board independence. A one standard deviation increase in ownership by passive funds is associated with about a 0.7 standard deviation increase in the share of directors on a firm's board that are independent. Second, passive ownership is associated with the removal of takeover defenses. A one standard deviation increase in ownership by passive funds is associated with a 3.5 percentage point increase in the likelihood of removing a poison pill and a 2.5 percentage point increase in the likelihood of reducing restrictions on shareholders' ability to call special meetings. These findings are economically large given that, on average, only 4% of firms remove a poison pill and 0.6% of firms eliminate restrictions on special meetings each year during our sample period. We find less evidence that passive ownership is associated with differences in other takeover defenses, including classified boards or supermajority voting requirements. Finally, an increase in passive ownership is associated with firms being less likely to have unequal voting rights, as captured by having a dual class share structure. A one standard deviation increase in ownership by passive funds is associated with about a one standard deviation decrease in likelihood of having a dual class share structure.

Our evidence suggests that a key mechanism by which passive investors exert their influence is through the power of their large voting blocs (i.e., voice). Passive ownership is associated with a decline in the share of votes in support of management proposals, suggesting managers face a more contentious and attentive shareholder base, and an increase in support for governance-related shareholder proposals. A one standard deviation increase in ownership by passive funds is associated with about a 0.75 standard deviation decline in support for management proposals and about a 0.5 standard deviation increase in support for governance proposals. We find little evidence that these differences in support are driven by a change in either the number or type of proposals brought to a vote.

Because the size and concentration of passive investors' ownership stakes can make it easier for activist investors to rally support for their demands (Brav, Jiang, Partnoy, and Thomas, 2008; Bradley, Brav, Goldstein, and Jiang, 2010), an alternative mechanism by which passive investors might influence governance outcomes is by facilitating the activist efforts of other investors. However, we find no evidence of a positive association between ownership by passive funds and the likelihood of a firm experiencing a hedge fund activism event or takeover event. Instead, we find evidence that a larger ownership stake by passive funds is associated with a decline in hedge fund activism; a one standard deviation increase in ownership by passive mutual funds is associated with a 1.6 percentage point decline in the likelihood of a hedge fund activism event (statistically significant at the 10% level). This decline in hedge fund activism is consistent with the engagement of passive investors reducing the need for activism by other investors. However, these findings do not exclude the possibility that passive investors' ownership stakes increase the threat of activism by others, and that this perceived threat increases the power of passive investors' voice. For example, companies might be responsive to the governance views of passive investors so as to lessen the likelihood that these investors later lend support to an activist campaign initiated by others.

Consistent with the observed changes in governance having a positive influence on firm value we find that, on average, an increase in passive ownership is associated with an improvement in firms' future performance. While we find no evidence of an association between passive ownership and measures of performance in our main IV specification, we find evidence that longer-term ownership by passive mutual funds is associated with significant improvements in firms' return on assets (ROA) and Tobin's Q. On average, a one standard deviation increase in ownership by passive funds is associated with about a third of a standard deviation increase in ROA. We find little evidence, however, that passive fund ownership is associated with differences in the level or composition of managerial pay (a fourth issue that is prominently discussed by passive investors during our sample period) or firms' capital structure or investments. Overall, the findings are consistent with passive investors improving firm value by insisting on basic governance-related changes, as these changes appear to improve firm value but require a low level of costly monitoring, while potentially avoiding more costly and firm-specific interventions related to managerial pay and firms' investment or capital structure choices.

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 adding various controls, including (1) firms' float-adjusted market cap, which is a proprietary measure used by Russell to determine a stock's ranking within indexes, (2) firms' industry, (3) firms' past stock returns, and (4) whether firms recently switched indexes. Moreover, the findings are robust to using alternative definitions of passive ownership as the key explanatory variable, including the institution-level (13F) ownership stake of the three largest passive institutions or institution-level measure of "quasi-index" ownership, as defined by Bushee (2001). Finally, we find no effect of passive ownership in placebo tests that assume differences 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, Erel, Ferreira, and Matos, 2011; Chung and Zhang, 2011), CEO pay sensitivity (Hartzell and Starks, 2003), and shareholder proposals (Gillan and Starks, 2000). Another strand studies the effects of institutional investors on corporate policies, including leverage (Michaely, Popadak, and Vincent, 2015), dividends (Grinstein and Michaely, 2005), and Research and Development (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, Jiang, Partnoy, and Thomas, 2008; Klein and Zur, 2009). We contribute to this literature by focusing on passive institutions—a less studied, but increasingly important set of institutional investors (e.g., see Cremers, Ferreira, Matos, and Starks, 2015). In this regard, our paper is related to studies of several pension funds that follow passive investment strategies but successfully engage in activism (e.g., Carleton, Nelson, and Weisbach, 1998; Del Guercio and Hawkins, 1999). Some argue that activism by pension fund managers is at least partially motivated by politics rather than wealth maximization (Romano, 1993). Given that such pressures are largely confined to public pension funds, it is not clear that this success extends to passive investors more generally. However, consistent with these case studies and contrary to survey evidence that passive investors might lack the willingness and ability to monitor managers (Useem, Bowman, Myatt, and Irvine, 1993), our evidence suggests that passive investors are not passive owners. In particular, we find evidence that passive mutual funds successfully influence firms' governance choices and improve long-term, firm-level performance.

The results of this paper also provide new insights into the determinants of firms' governance structures and how large shareholders 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; Levit, 2013). Voice refers to direct intervention by shareholders through either formal (e.g., proxy voting) or informal (e.g., letters to the board) channels (Harris and Raviv, 2010; Levit and Malenko, 2011; Maug, 1998; Shleifer and Vishny, 1986), while exit refers to the threat or actual selling of shares (Admati and Pfleiderer, 2009; Edmans, 2009; Edmans and Manso, 2011). However, because passive funds maintain portfolio weights that are often closely aligned with the weights in their chosen benchmark, their ability to influence managers is primarily limited to voice, which is thought to constrain their ability to influence corporate outcomes. Our paper finds otherwise.[5]

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, 2015), the importance of institutional investors' portfolio weights for monitoring incentives (Fich, Harford, and Tran, 2015), and the association between institution-level (13F) ownership and payouts, investment, CEO pay, management disclosure, acquisitions, and CEO power (Boone and White, 2015; Crane, Michenaud, and Weston, 2014; Lu, 2013; Mullins, 2014; Schmidt, 2012). In contrast to these papers, we use the Russell 1000/2000 cutoff and fund-level data to isolate variation in ownership by passively managed mutual funds, 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).[6]

2. Sample, data sources, and descriptive statistics

In this paper, we merge stock-level mutual fund ownership data 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.

2.1. Mutual fund holdings and Russell 1000/2000 index membership

We use the S12 mutual fund holdings data compiled by Thomson Reuters and available from Wharton Research Data Services (WRDS) to compute mutual fund holdings in a stock as a percent of its market capitalization. Since May 2004, all mutual funds holding stocks traded on U.S. exchanges are required to report those holdings every quarter to the Securities and Exchange Commission (SEC) using Forms N-CSR and N-Q. Reported securities include all NYSE/Amex/Nasdaq, Toronto, and Montreal common stocks. Before May 2004, funds were required to report holdings only twice a year using Form N-30D, but many mutual funds voluntarily reported holdings in the

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[5] In this regard, our findings complement those of Iliev and Lowry (2015), 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 recommen-

dations on non-binding shareholder proposals). 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 of passive investors results in actual differences in firms' governance structures and performance.

[6] Beyond our focus on passively managed mutual funds and their impact on governance outcomes and corporate performance, our empirical methodology also differs from previous and contemporaneous papers that use the Russell cutoff as a source of identification. And in contrast to findings in some of these previous studies, with our IV methodology we do not find differences in ownership by active institutions around the Russell 1000/2000 threshold, nor do we find that index assignment affects other corporate outcomes, including capital structure, investments, the composition of managerial pay, CEO turnover, and acquisitions. The tradeoffs of the different methodologies used in this identification setting are discussed in Appel, Gormley, and Keim (2015), which can be found at http://ssrn.com/abstract=2641548.

other two quarters. To adjust for any missing/unreported holdings between report dates prior to May 2004, we populate missing holdings by assuming that the holdings from the earlier date stay constant and use monthly data on prices and adjustment factors from Center for Research in Security Prices (CRSP) to compute imputed dollar values of these holdings.[7] We exclude observations in which the total mutual fund holdings exceed a firm's market capitalization. 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).

To classify a mutual fund as either passively managed or actively managed, we use a method similar to that of Busse and Tong (2012) and Iliev and Lowry (2015). Specifically, we obtain fund names by merging the Thomson Reuters data with the CRSP mutual fund data using the MFLINKS table available on WRDS. We then flag a fund as passively managed if its fund name includes a string that identifies it as an index fund or if the CRSP Mutual Fund Database classifies the fund as an index fund.[8] We classify all other mutual funds that can be matched to the CRSP mutual fund data as actively managed, and funds that cannot be matched are left unclassified. To generate variables for mutual fund ownership disaggregated into these three categories, we compute the percentage of each stock's market capitalization that is owned by passive, active, and unclassified mutual funds at the end of each quarter.

Our 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 3.

2.2. Governance, voting, accounting, and compensation data

Governance and voting data are mainly from Institutional Shareholder Services (ISS), formerly known as Riskmetrics, which provides information on several aspects of corporate governance for firms in the S&P 1500. Following ISS's 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 data set. The governance data set from ISS is used to create indicator variables for whether a firm removes a takeover defense or has a dual class share structure 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 ISS 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 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 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. The database covers all firms in the Russell 3000 beginning in 2001. We define our variable for poison pill removal as an indicator equal to one 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 Table A.1.

2.3. Sample and descriptive statistics

For our main analysis, we restrict our sample to stocks in the 250 bandwidth 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, and as discussed in Section 7.1, our subsequent findings are robust to using both wider and narrower bandwidths.

Table 1 reports summary statistics for our main sample. The average level of mutual fund ownership (as a percentage of shares outstanding) is around 25%. Actively managed funds are the largest category (approximately 19% of shares outstanding), with passive and unclassified funds each accounting for about 3% of shares outstanding. 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 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 uncommon events in our sample, occurring in just 4% and 0.6% of firm-year observations, respectively. About 13% of firms have a dual class share structure. Finally, firms' ROA averages about 0.03.

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[7] WRDS estimates that approximately 60% of funds additionally report holdings every quarter before 2004. Thanks to Denys Glushkov at WRDS for assistance with S12 holdings.

[8] The strings we use to identify index funds are: *Index, Idx, Indx, Ind_* (where_ indicates a space), *Russell, S & P, S and P, S&P, SandP, SP, DOW, Dow, DJ, MSCI, Bloomberg, KBW, NASDAQ, NYSE, STOXX, FTSE, Wilshire, Morningstar, 100, 400, 500, 600, 900, 1000, 1500, 2000*, and *5000*.

Table 1

Summary statistics.

This table reports summary statistics of our key variables for our main sample: firms in the 250 bandwidth around the cutoff between the Russell 1000 and 2000 indexes from 1998–2006. Definitions for all variables are provided in Table A.1. Accounting variables are winsorized at the 1% level, and we delete observations where either mutual fund ownership is missing or total mutual fund holdings exceed a stock's market capitalization.

	Obs.	Mean	Median	SD
Total mutual fund ownership %	4,415	25.2	25.0	12.9
Passive ownership %	4,415	3.0	2.6	2.3
Active ownership %	4,415	18.9	18.1	10.9
Unclassified ownership %	4,415	3.2	2.5	2.9
Independent director %	2,871	65.1	66.7	18.1
Poison pill removal	2,957	0.04	0	0.19
Greater ability to call special meeting	1,858	0.006	0	0.08
Indicator for dual class shares	1,858	0.13	0	0.33
Mngt. proposal support %	1,288	84.7	87.2	11.9
Shareholder gov. proposal support %	202	36.3	31.5	22.8
Indicator for hedge fund activism	4,415	0.016	0	0.12
ROA	4,291	0.03	0.04	0.11

3. Empirical framework

Identifying the impact of passive investors on corporate governance and performance poses an empirical challenge. Cross-sectional correlations between passive ownership, governance, and performance might not reflect a causal relation because ownership by passive investors could be correlated with factors—such as firms' access to capital, investment opportunities, or ownership by active investors—that directly affect corporate outcomes. Failure to control for such factors could introduce an omitted variable bias that confounds inferences. To overcome this challenge 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 mutual funds. We now describe our identification strategy.

3.1. Russell index construction and passive institutional investors

Passive funds attempt to match the performance of a market index by holding a basket of representative securities in the particular market index being tracked in proportion to their weights 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. The Russell 1000 comprises the largest 1,000 U.S. stocks in terms of market capitalization, while the Russell 2000 comprises the next largest 2,000 stocks. An example of an index fund that uses the Russell 1000 as a benchmark is the Vanguard Russell 1000 Index Fund (VRNIX), while the Vanguard Russell 2000 Index Fund (VRTIX) uses 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 12 months using market capitalization as of the last trading day in May of that

year.[9] In other words, the Russell 1000 includes the 1,000 largest stocks at the end of the last trading day in May, while the Russell 2000 includes the next 2,000 largest stocks.[10] 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.

Because the Russell indexes are value-weighted, index assignment has a significant effect on portfolio weights; the 1,000th 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 1,001st largest stock will be included in the Russell 2000 and be given

[9] 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 12 months, stocks are only deleted from the indexes due to Chapter 7 bankruptcy filings, delistings, and corporate actions (takeovers), while Initial Public Offerings (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).

[10] Beginning in 2007, Russell implemented a "banding" policy in which 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 1,000 largest firms this year would only move to the Russell 1000 index if its market capitalization exceeded a certain threshold (Investment Technology Group, 2008). Because 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 in which only the end-of-May market capitalization calculated by Russell is used to determine firms' index assignment. For more details on how the banding thresholds are determined each year, see Russell Investments (2013).
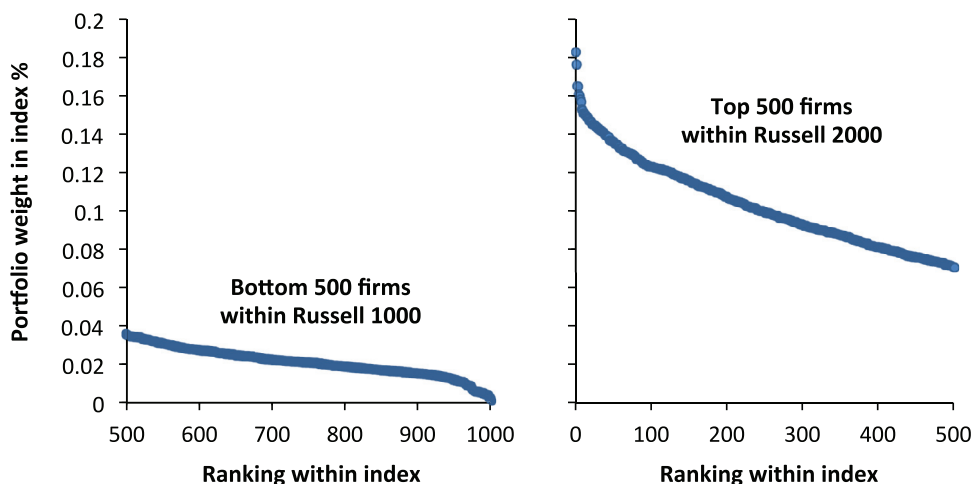
Fig. 2. Portfolio weights in the Russell 1000 and 2000 indexes by within-index ranking for the year 2006. This figure plots the portfolio weights of the bottom 500 firms in the Russell 1000 index and the top 500 firms in the Russell 2000 index for the end-of-June 2006. Observations are ordered by their within-index ranking such that rankings of 1 and 1,000 represent the firms with the largest and 1,000th largest portfolio weight in the index, respectively. The portfolio weights are given as a percent.

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%. The difference in portfolio weights persists over a wide range around the cutoff. This is seen in Fig. 2, in which 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 passive 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 of stocks at the bottom of the index. 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 of the considerable amount of money passively tracking the two Russell indexes (Chang, Hong, and Liskovich, 2015), the portfolio decisions of passive institutions can lead to large ownership differences in stocks around the Russell 1000/2000 threshold.

The importance of index assignment for ownership by passive mutual funds is illustrated in Fig. 3, in which we sort stocks using their end-of-May CRSP market capitalization and plot the average share of firms in the Russell 2000 and average end-of-September ownership by passively managed funds. The sample in Fig. 3 contains the top 500 stocks of the Russell 2000 and bottom 500 stocks of the Russell 1000 for each year between 1998 and 2006, as determined using the end-of-June Russell-assigned portfolio weights within each index. By construction, the top panel of Fig. 3 shows no break in size between the 500th

and 501st largest stocks in this sample, but as shown in the middle panel, there is a rather large jump in the probability of being assigned to the Russell 2000 index around this break. The end-of-May market cap reported by CRSP does not perfectly predict a stock's index assignment because Russell makes a number of adjustments when calculating its proprietary market capitalization values such that these values, which are used to determine a stock's index membership, do not perfectly match market capitalizations reported in sources such as CRSP. And consistent with index assignment having an important impact on ownership, the bottom panel of Fig. 3 demonstrates a distinct jump in the ownership of passive funds around this midway point. During our sample period, the total ownership stake of passive funds is, on average, 66% higher for a stock among the top 250 stocks of the Russell 2000 relative to a stock among the bottom 250 stocks of 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 two to three times more dollars passively tracking the Russell 1000 relative to the Russell 2000 (see Chang, Hong, and Liskovich, 2015, Table 1, Panel A).[11] 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

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[11] 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.

Ln(Market capitalization)
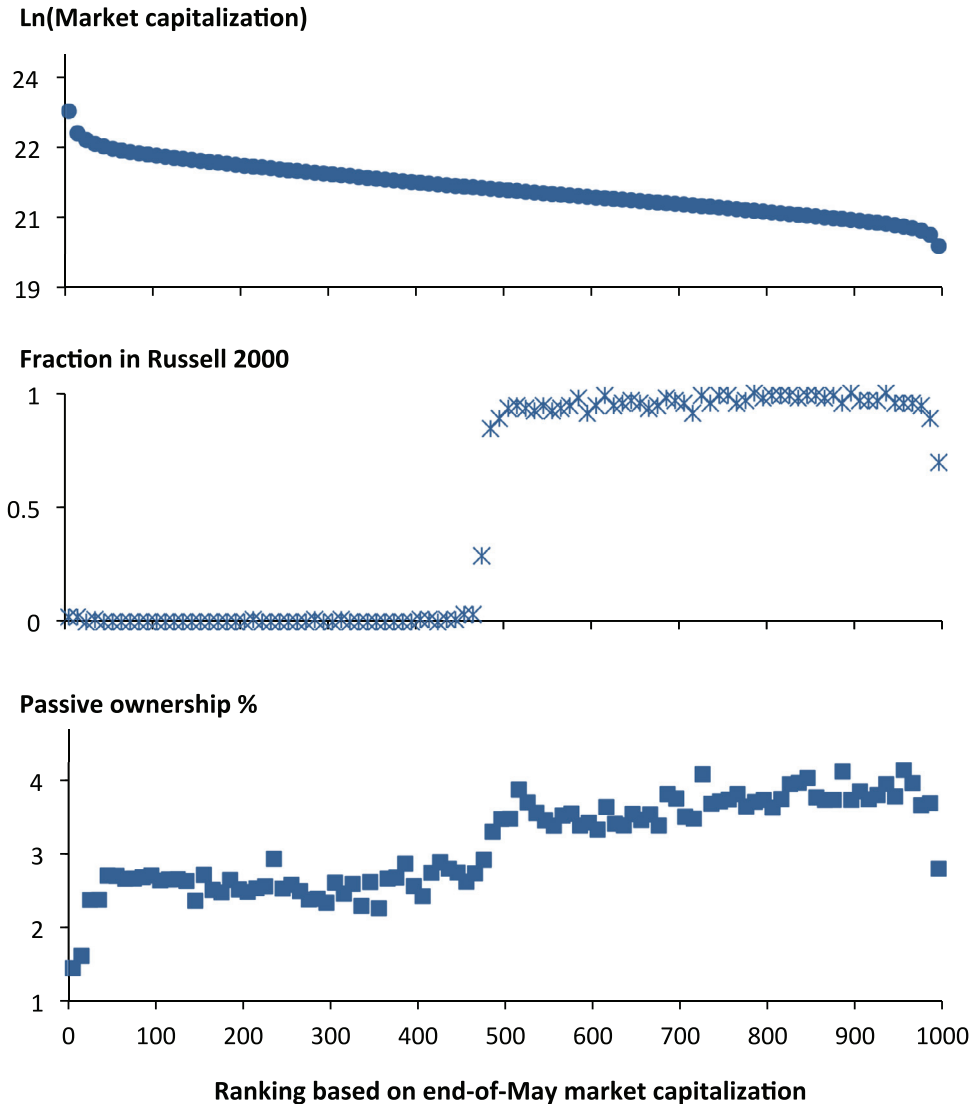
Fig. 3. Market capitalization, index assignment, and passive ownership by market capitalization rankings for the bottom 500 firms of Russell 1000 and top 500 firms of Russell 2000. This figure plots the average end-of-May Ln(Market capitalization), fraction of firm-year observations in the Russell 2000, and passive mutual fund 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. Passive mutual fund ownership is calculated as of September each year, and all averages are calculated using bins of ten firms and data from 1998–2006. For the passive ownership panel, we scale the vertical axis to report a standard deviation on each side of the sample mean.

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 2.1 percentage point increase we detect in 2004 using our measure of passive ownership. In practice, the realized differences in passive ownership we detect will be slightly smaller around the cutoff than predicted by this simple back-of-the-envelope calculation because passive investments by some institutions, like pension funds, are not reported in the S12 mutual fund database.

The importance of index assignment for passive ownership is further highlighted by examining the total owner-

ship stake of three of the largest passive institutions during our sample period—Vanguard, State Street, and Barclays Bank (which owned iShares during our sample). For this, we use the Thomson Reuters Institutional Holdings (13F) Database, which reports the total holdings, both passive and active, of each institution. On average, the ownership stake of each of these three institutions is a third higher for the 250 firms at the top of the Russell 2000 relative to the bottom 250 firms of the Russell 1000, while the likelihood of each institution owning more than 5% of a firm's shares is two-thirds higher and the likelihood of being a top five shareholder is 15% higher.

We find no evidence that index assignment is related to ownership by actively managed funds. This is shown in

Active ownership %

Unclassified ownership %

Ranking based on end-of-May market capitalization

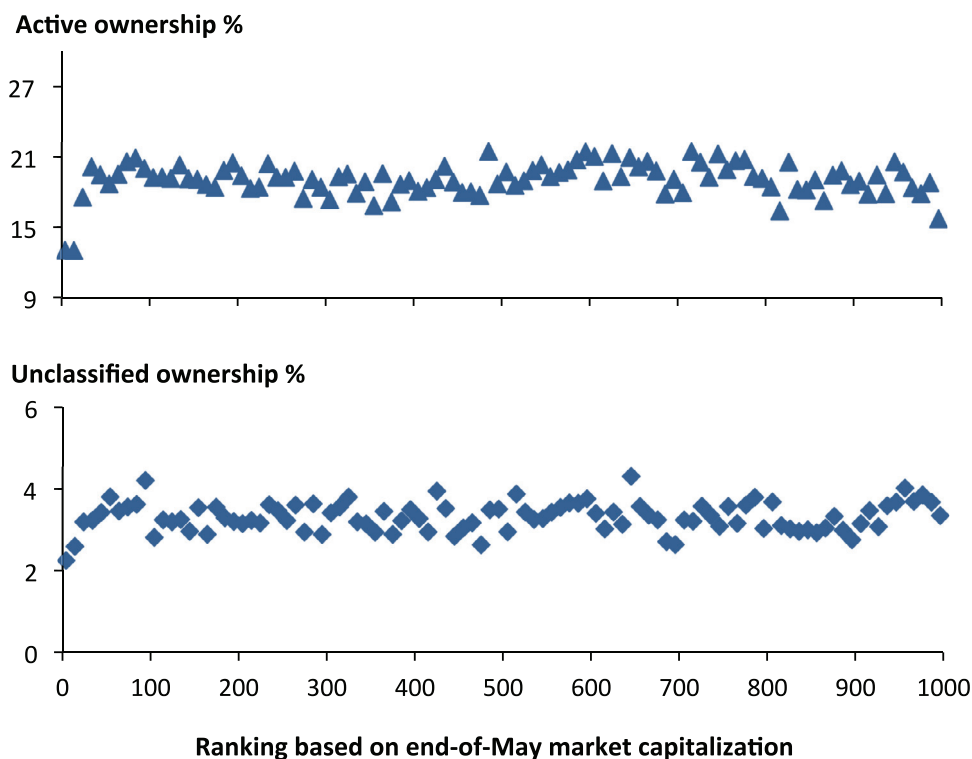**Fig. 4.** Active and unclassified mutual fund ownership by market capitalization rankings for the bottom 500 firms of Russell 1000 and top 500 firms of Russell 2000. This figure plots the average unclassified and active mutual fund ownership (%) by ranking, where ranking is determined using end-of-May 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. Mutual fund ownership is calculated as of September each year, and all averages are calculated using bins of ten firms and data from 1998–2006. For each ownership panel, we scale the vertical axis to report a standard deviation on each side of the sample mean.

the two panels of Fig. 4 in which we plot the percent ownership for actively managed funds and mutual funds we are unable to classify. For each panel, we scale the vertical axis to span a standard deviation on each side of the sample mean. As seen in those panels, there is no corresponding difference in either active or unclassified mutual fund ownership; we formally test and demonstrate this lack of a difference in other types of ownership in Section 3.3.

3.2. 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 mutual funds. 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 1,000th 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 mutual funds on firms' corporate governance and corporate performance; specifically, we use inclusion in the Russell 2000 as an instrument for ownership by passive funds. Because index assignment is determined by a stock's market capitaliza-

tion, and because market capitalization can 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:

$$Y_{it} = \alpha + \beta Passive\%_{it} + \sum_{n=1}^{N} \theta_n (Ln(Mktcap_{it}))^n$$
$$+ \gamma Ln(Float)_{it} + \delta_t + \varepsilon_{it}, \qquad (1)$$

where Y_{it} is the outcome of interest for firm i in reconstitution year t (i.e., from end-of-June year t to end-of-June of year $t+1$) scaled by its sample standard deviation; $Passive\%_{it}$ is the percent of a firm's shares held by passively managed mutual funds at the end of the first quarter of the reconstitution year t (i.e., end of September) scaled by its sample standard deviation; $Mktcap_{it}$ is the end-of-May CRSP market capitalization of stock i in year t; and $Float_{it}$ is the float-adjusted market capitalization calculated by Russell when initially setting the portfolio weights during the end-of-June reconstitution. We scale both Y_{it} and $Passive\%_{it}$ by their sample standard deviations so that the point estimate of β can be interpreted as the standard deviation difference in Y_{it} for a one standard deviation increase in $Passive\%_{it}$. 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 might affect firms' governance and other corporate outcomes (Back, Li, and Ljungqvist, 2014; Edmans, Fang, and Zur, 2013). We also include reconstitution 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 Fig. 1). Finally, we cluster the standard errors, ε, at the firm level.[12]

To account for the possibility that ownership by passive funds, as measured using *Passive%*, might be correlated with the error term, ε, because of the omitted variable issues discussed above, we instrument for ownership by passive funds using index assignment. Specifically, we instrument *Passive%* 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 reconstitution year t. As shown in Fig. 3, being assigned to the Russell 2000 is associated with a significant jump in ownership by passive funds for stocks at the top of Russell 2000 relative to stocks at the bottom of the Russell 1000.

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 *Passive%* (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 restrict our sample to the 250 stocks at the bottom of the Russell 1000 and top 250 stocks of the Russell 2000 and include a robust set of controls for firms' log market capitalization, *Ln(Mktcap)*, as measured using CRSP data, by varying the polynomial order N we use to control for end-of-May market capitalization.[13] In later robustness tests, we also show robustness to varying the number of firms we include around the cutoff between the two indexes and to instead using end-of-May market caps to rank stocks and select our sample each year.

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 within the benchmark to hold, 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 passively managed mutual funds seeking to minimize their tracking error.

We do not use the actual portfolio weight or ranks of stocks as our instrument because this would introduce a potentially serious endogeneity concern. In particular, this is problematic because after Russell assigns stocks to an index, it determines actual weights using various endogenous factors, including liquidity and inside ownership. For the most illiquid, highest-inside-ownership stocks, Russell assigns a smaller portfolio weight than would be justified based purely on their end-of-May market capitalization so as to minimize the costs of institutions attempting to track the index. Because Russell index weights are related to a stock's liquidity and inside ownership, it would be problematic to use them as instruments because both factors could directly affect the governance structures of firms.[14]

3.3. First-stage estimation

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

$$Passive\%_{it} = \eta + \lambda R2000_{it} + \sum_{n=1}^{N} \chi_n (Ln(Mktcap_{it}))^n$$
$$+ \sigma Ln(Float)_{it} + \delta_t + u_{it}, \qquad (2)$$

where $R2000_{it}$ is a dummy variable equal to one if stock i is in the Russell 2000 index for reconstitution year t (i.e., from end-of-June of year t to end of June year $t+1$). In our initial tests, we also analyze other outcome measures, including the percentage of shares outstanding owned by all mutual funds; the percentage of shares outstanding owned by actively managed funds; and the percentage of shares outstanding owned by unclassified mutual funds. The model is estimated over the 1998–2006 period, and uses a bandwidth of 250 firms and a third-order polynomial.

The results, reported in Table 2, confirm that mutual fund ownership is related to membership in the Russell, particularly for passive mutual funds. So that the point estimates in Table 2 align with the observed differences in ownership shown in Fig. 3, we do not scale the ownership variables by their sample standard deviations in these initial estimates. The first column shows that aggregate mutual fund ownership is significantly higher (at the 10% level) for the 250 stocks at the top of the Russell 2000 than for the 250 stocks at the bottom of the Russell 1000. As expected, this relation appears to be driven entirely by passive funds: the estimated coefficient is positive and significant at the 1% level for the passive funds (column 2), but insignificant for actively managed and unclassified funds (columns 3 and 4).

In Table 3 we demonstrate that the estimated relation between passive ownership and Russell 2000 membership

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[12] 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).

[13] At some level, our estimation can be viewed as one that makes use of a threshold event in a non-Regression Discontinuity (RD) estimation, as discussed in Bakke and Whited (2012).

[14] Chang, Hong, and Liskovich (2015) and Mullins (2014) also discuss this issue of why the actual weights or rankings should not be used as instruments or as part of a regression discontinuity estimation.

Table 2

Impact of index assignment on mutual fund ownership.

This table reports estimates of a regression of mutual fund holdings on an indicator for membership in the Russell 2000 index plus additional controls. Specifically, we estimate

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

where $R2000_{it}$ is a dummy variable equal to one 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, N is the polynomial order we use to control for $Ln(Mktcap_{it})$, $Float_{it}$ is the float-adjusted market value of equity (provided by Russell) at June 30 in year t, and δ_t are year fixed effects. $Ownership\%_{it}$ measures mutual fund ownership (in percent) for stock i at the end of September in year t. In this table we use four different definitions for $Ownership\%$ for stock i: (1) the percentage of shares outstanding owned by all mutual funds (from S12 filings); (2) the percentage of shares outstanding owned by "passive" funds; (3) the percentage of shares outstanding owned by "active" mutual funds; and (4) the percentage of shares outstanding owned by "unclassified" mutual funds. The mutual fund classifications are defined in Section 2.1 of the text. The sample consists of the top 250 firms in the Russell 2000 index and bottom 250 firms of the Russell 1000 index (i.e., bandwidth=250) for which we obtain holdings data from Thomson Reuters Mutual Fund Holdings Database and which we match with data from the monthly CRSP file. The model is estimated over the 1998–2006 period using a polynomial order control for $Ln(Mktcap)$ of $N=3$. Standard errors, ε, are clustered at the firm level and reported in parentheses. The symbols * and *** indicate significance at the 10% and 1% levels, respectively.

Dependent variable =	Percent of firm's common shares held by:			
	All mutual funds	Passive	Active	Unclassified
	(1)	(2)	(3)	(4)
R2000	1.216*	1.086***	0.118	0.012
	(0.662)	(0.067)	(0.604)	(0.135)
Bandwidth	250	250	250	250
Polynomial order, N	3	3	3	3
Float control	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
# of firms	1,654	1,654	1,654	1,654
Observations	4,415	4,415	4,415	4,415
R-squared	0.21	0.62	0.12	0.09

Table 3

First-stage estimation for ownership by passively managed funds.

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

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

where $R2000_{it}$ is a dummy variable equal to one 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. $Passive\%_{it}$ is the percentage of shares outstanding owned by passively managed mutual funds, as defined in Section 2.1 of the text, for stock i at the end of September in year t scaled by its sample standard deviation. The data consist of firms in the two Russell indexes for which we obtain holdings data from Thomson Reuters Mutual Fund Holdings Database 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 and reported in parentheses. *** indicates significance at the 1% level.

Dependent variable =	Passive % scaled by its sample standard deviation		
	(1)	(2)	(3)
R2000	0.505***	0.512***	0.473***
	(0.028)	(0.028)	(0.029)
Bandwidth	250	250	250
Polynomial order, N	1	2	3
Float control	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
# of firms	1,654	1,654	1,654
Observations	4,415	4,415	4,415
R-squared	0.61	0.62	0.62

is robust to using lower order polynomials, and to better quantify the economic magnitude of the observed difference in ownership, we scale *Passive%* by its sample standard deviation. Using a bandwidth of 250 firms and varying the polynomial order of controls for market cap, we consistently find an increase in ownership by passive funds of about a half of a sample standard deviation (Table 3, columns 1–3). In all cases, the increase is statistically significant at the 1% level.[15]

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[15] Because our IV model is just-identified, the IV estimation is median-unbiased and weak instruments are unlikely to be a concern in our set-

The lack of a difference in ownership for actively managed and unclassified mutual funds is also robust to varying the polynomial order of controls for *Mktcap*. This can be seen in Table A.2. Consistent with actively managed funds being unaffected by a stock's index assignment, we find no evidence of a difference in ownership by either actively managed funds or unclassified funds and the point estimates are economically small (between 1% and 5% of a their sample standard deviations).

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 assignment might improve firms' governance. In particular, if we re-estimate Eq. (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.

3.4. Why index assignment might 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 our findings below suggest), 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 might 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 com-

petitors with lower costs and lower tracking errors. Second, index assignment can create a coordinated increase in ownership by passive institutions that might otherwise be hard to replicate. Achieving the same total increase in ownership stake can be prohibitively large for any one passive institution to achieve alone, and coordinating a combined ownership increase among multiple passive institutions might 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 suggests that institutions managing passive funds 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 can exert influence.

4. How passive investors affect firms' corporate governance

To select the governance outcomes for our analysis, we start from a 2014 speech given by the Chairman and CEO of Vanguard, Bill McNabb, that summarizes the broad governance issues on which Vanguard focuses. These issues include "Independent oversight" (i.e., board independence), "Annual director elections and minimal anti-takeover devices," "Shareholder voting rights consistent with economic interest" (i.e., no dual class share structures that provide disparate voting rights to different groups of shareholders), and "Sensible compensation tied to performance."[16] We then compare these issues to the proxy-voting policies of Vanguard and other large passive investors during our earlier sample period by obtaining the initial proxy-voting policies provided to the SEC by Vanguard, State Street, and Barclays Bank when the filing of such policies was first required beginning on July 1, 2003. From these proxy-voting policies, it is clear that these four broad governance issues were also a focus of passive investors during our sample period. In particular, the largest passive investors (1) supported greater board independence, (2) opposed takeover defenses, (3) opposed unequal voting rights, as occurs when firms maintain a dual class share structure, and (4) supported compensation plans that align management's interests with shareholders and avoid excessive awards (see Appendix).[17]

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ting, 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 (Stock, Wright, and Yogo, 2002; Angrist and Pischke, 2009).

[16] This speech, which can be found at http://www.lerner.udel.edu/sites/default/files/WCCG/PDFs/events/Tran-script%20_UDel%20Corp%20Governance%2010%2030%202014_%20FINAL%20for%20UD%20website.pdf, is based on the governance principles Vanguard states on its website at https://about.vanguard.com/vanguard-proxy-voting/corporate-governance/index.html (Vanguard, 2014). Two other governance issues that were discussed in this speech, but are not as easily tested, are "Accountability" (of both the board and management) and "Shareholder engagement."

[17] These historical proxy-voting guidelines can be found on the SEC website and are summarized in the Appendix. Other popular governance issues, like splitting the positions of CEO and Chairman of the Board, however, are not mentioned in either the Vanguard speech or the proxy-voting guidelines of the largest passive investors. At some level, this par-

Table 4

Ownership by passive investors and board independence.

This table reports estimates of our instrumental variable estimation used to identify the effect of ownership by passive investors on board independence. Specifically, we estimate

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

where Y_{it} is the percentage of independent directors on the board of firm i in year t (from Riskmetrics) scaled by its sample standard deviation, $Passive\%_{it}$ is the percentage of shares outstanding owned by passively managed funds (as defined in the text) for stock i at the end of September in year t scaled by its sample standard deviation, $Mktcap_{it}$ 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. 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 holdings data from Thomson Reuters Mutual Fund Holdings Database and which we match with data from the monthly CRSP file. The model is estimated over the 1998–2006 period using 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 and reported in parentheses. *** indicates significance at the 1% level.

Dependent variable =	Independent director %		
	(1)	(2)	(3)
Passive %	0.729***	0.762***	0.654***
	(0.160)	(0.162)	(0.159)
Bandwidth	250	250	250
Polynomial order, N	1	2	3
Float control	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
# of firms	1,082	1,082	1,082
Observations	2,871	2,871	2,871

But, do passive investors, whose impact tends to be limited to "voice," have an effect on these aspects of corporate governance? In this section, we investigate these questions using the identification strategy and instrumental variable estimation described in Section 3 to analyze their impact on three of these issues: board independence, takeover defenses, and equal voting rights. We will analyze their impact on the fourth issue, the level and structure of executive compensation, in Section 6.2.

4.1. Independent directors

We first assess whether passive mutual funds exert influence on board independence. Increasing the percent of independent directors was a specific concern of many passive investors during our sample period (see Appendix) and is one dimension of governance in which passive investors have a direct say via their proxy votes in director elections. Passive investor support for independent directors 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 direc-

tors, scaled by its sample standard deviation, as the dependent variable.

We find that passive mutual funds do indeed have a significant impact on this key dimension of corporate governance. We find a statistically significant positive relation (at the 1% level) between *Passive%* and the percentage of independent directors that is robust to various polynomial order controls for market capitalization. The economic magnitude of the relation is sizable. A one standard deviation increase in ownership by passive funds is associated with a 0.65–0.76 standard deviation increase in the share of independent directors on a firm's board (Table 4, columns 1–3). 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 funds is associated with smaller boards.[18]

The impact of passive mutual funds on board independence is even larger prior to changes regarding board independence requirements at the NYSE and Nasdaq exchanges. In late 2002, both exchanges 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 a larger influence on board independence prior to 2003, we find that a one standard deviation increase in ownership by passive funds is associated with a 1.3–1.4 standard deviation increase in share of independent directors on a firm's board prior to 2003 (Table 5, columns 1–3) but only a 0.26–0.35 standard deviation increase after 2002 (columns 4–6). The differences in the estimates across time periods are statistically significant at the 1% confidence level.[19]

4.2. Takeover defenses

We now consider the association between ownership by passive mutual funds and takeover defenses. Opposition to takeover defenses, including poison pills and restrictions on shareholders' ability to call special meetings, were a common theme of passive investors' proxy-voting guidelines during our sample (see Appendix).

While poison pills can 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,

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ticular exclusion is not surprising since some passive institutions (e.g., Vanguard) have the same individual act as both CEO and Chairman, and consistent with passive investors not holding a view on this issue, we find no association between passive ownership and whether a company's CEO serves as Chairman of the Board.

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[18] Because ISS 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. The first-stage estimates in the smaller sample of observations with non-missing director data remain statistically significant at the 1% level. This can be seen in Appendix Table 3, Panel A. The first-stage estimates for our later estimates in Tables 6–8 can also be found in Appendix Table 3. We do not separately report first-stage estimates for Tables 9 and 10 since their samples are comparable to that used in Table 3.

[19] While the proposed exchange listing requirements did not become effective until 2004, many firms began complying in 2003. Given this, we use the year 2003 as the potential breaking point.

Table 5

Passive ownership and board independence, pre- versus post-2002 rule change.

This table reports estimates of the second-stage regression of our instrumental variable estimation used to identify the effect of 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. Both the dependent variable and *Passive%* are scaled by their sample standard deviations. Standard errors, ε, are clustered at the firm level and reported in parentheses. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable =	Independent director %					
	Sample years = 1998–2002			Sample years = 2003–2006		
	(1)	(2)	(3)	(4)	(5)	(6)
Passive %	1.314***	1.461***	1.257***	0.354***	0.324**	0.264*
	(0.298)	(0.303)	(0.297)	(0.136)	(0.137)	(0.160)
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	882	882	882	549	549	549
Observations	1,682	1,682	1,682	1,189	1,189	1,189

and Ferrell, 2009). While Coates (2000) notes that essentially every firm has a "shadow pill" in place because a pill can 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.[20] Moreover, institutional investors widely call for the redemption of poison pills and support efforts to subject them to shareholder votes to improve the accountability of managers and boards.

We find evidence that ownership by passive funds 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 Eq. (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 is positive and statistically significant (at the 1% level). A one standard deviation increase in *Passive%* is associated with a 0.18–0.20 standard deviation (i.e., 3.3–3.8 percentage point) increase in the likelihood of a poison pill being removed (Table 6, columns 1–3). 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 mutual funds 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 Eq. (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 funds is associated with the removal of restrictions on shareholders' ability to call special meetings. The estimated coefficient is positive and statistically significant (at the 1% level) in all of the estimations; in particular, a one standard deviation increase in passive ownership is associated with about a 0.30–0.34 standard deviation (i.e., 2.4–2.7 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 0.6%, the estimated magnitude is sizable.

In unreported analysis, we also analyzed the impact of passive ownership on whether firms have annual director elections. Staggered director elections and classified boards are another type of takeover defense that passive institutions typically oppose [see McNabb (2014) and the Appendix for examples]. 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 could 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. Consistent with this possibility, we find stronger evidence that passive ownership is associated with firms being less likely to have a classified board after 2003, but the estimates are only statistically significant in bandwidths wider than the 250 stocks around the threshold we use in our main analysis.[21]

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[20] 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'."

[21] In unreported analysis, we also analyzed the impact of passive ownership on supermajority vote requirements, a fourth antitakeover device specifically mentioned in Vanguard and State Street's historical proxy-voting policies. We find a negative association between passive ownership and the likelihood a firm has supermajority voting requirements, but the point estimates are neither statistically significant nor economically large.

Table 6

Ownership by passive investors and takeover defenses.

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

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

where Y_{it} is the governance variable for firm i in year t scaled by its sample standard deviation, $Passive\%_{it}$ is the percentage of shares outstanding owned by passively managed mutual funds (as defined in Section 2.1 of the text) for stock i at the end of September in year t scaled by its sample standard deviation, $Mktcap_{it}$ 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. 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 $Passive\%$ 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 holdings data from Thomson Reuters Mutual Fund Holdings Database 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-order polynomial controls for $Ln(Mktcap)$. Standard errors, ε, are clustered at the firm level and reported in parentheses. *** indicates significance at the 1% levels.

Dependent variable =	Poison pill removal			Greater ability to call special meeting		
	(1)	(2)	(3)	(4)	(5)	(6)
Passive %	0.176***	0.181***	0.203***	0.304***	0.310***	0.341***
	(0.0647)	(0.0650)	(0.0741)	(0.0999)	(0.108)	(0.114)
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	1,164	1,164	1,164	1,050	1,050	1,050
Observations	2,957	2,957	2,957	1,858	1,858	1,858

4.3. Equal voting rights and dual class share structures

Finally, we analyze whether ownership by passive mutual funds is associated with the voting rights of shareholders. Passive institutions uniformly oppose dual class share structures and any other form of unequal voting rights and often threaten to withhold support for managers or directors of any company that does not provide equal voting rights to all shareholders (see McNabb, 2014 and the Appendix for examples). Passive institutions also state they will refuse to support any attempts by companies to implement a dual class share structure (as might occur during a merger). Moreover, by concentrating voting power among insiders, Klausner (2012) argues that dual class share structures are one of the most powerful takeover defenses, providing yet another reason passive investors oppose them, and Gompers, Ishii, and Metrick (2010) find evidence that dual class share structures can negatively impact firm value.

To assess whether ownership by passive mutual funds is associated with a firm being less likely to have unequal voting rights, we construct an indicator that equals one if the firm has a dual class share structure, and zero otherwise, as determined by ISS. These estimates are reported in Table 7. We find evidence that ownership by passive funds is associated with firms being less likely to have a dual class share structure. The estimated coefficient is negative and statistically significant (at the 1% level) in all of the estimations; a one standard deviation increase in $Passive\%$ is associated with about a one standard deviation decrease in the likelihood that a firm has a dual class share structure.[22]

Table 7

Ownership by passive investors and dual class share structures.

This table reports estimates of our instrumental variable estimation used to identify the effect of passive investors on the likelihood of dual class shares. Specifically, we estimate

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

where Y_{it} is an indicator equal to one if firm i has dual class shares in year t according to Riskmetrics scaled by its sample standard deviation, $Passive\%_{it}$ is the percentage of shares outstanding owned by passively managed mutual funds (as defined in Section 2.1 of the text) for stock i at the end of September in year t scaled by its sample standard deviation, $Mktcap_{it}$ 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. 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 holdings data from Thomson Reuters Mutual Fund Holdings Database 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 and reported in parentheses. *** indicates significance at the 1% level.

Dependent variable =	Indicator for dual class shares		
	(1)	(2)	(3)
Passive %	−0.886***	−1.031***	−1.005***
	(0.179)	(0.167)	(0.181)
Bandwidth	250	250	250
Polynomial order, N	1	2	3
Float control	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
# of firms	1,050	1,050	1,050
Observations	1,858	1,858	1,858

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[22] 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

Table 8

Ownership by passive investors and shareholder support for proposals.

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

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

where Y_{it} is either the average percentage of shareholders that vote along with management proposals at annual meetings for firm 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) each scaled by their sample standard deviation, $Passive\%_{it}$ is the percentage of shares outstanding owned by passively managed mutual funds (as defined in Section 2.1 of the text) for stock i at the end of September in year t scaled by its sample standard deviation, $Mktcap_{it}$ 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. 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 holdings data from Thomson Reuters Mutual Fund Holdings Database 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 and reported in parentheses. 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)
Passive %	−0.783***	−0.745***	−0.734***	0.492**	0.649*	0.622*
	(0.180)	(0.179)	(0.231)	(0.247)	(0.348)	(0.336)
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	775	775	775	127	127	127
Observations	1,288	1,288	1,288	202	202	202

Another voting rights issue that is discussed in the proxy-voting guidelines of passive investors is their opposition to cumulative voting. As Vanguard states in its proxy-voting guidelines, cumulative voting can allow "shareholders a voice in director elections that is disproportionate to their economic investment in the corporation." However, in unreported analysis, we do not find an association between passive ownership and whether firms have cumulative voting for directors.

5. Possible mechanisms by which passive investors influence governance

A key mechanism by which passive investors might influence a firm's governance structure is via their voice. In particular, passive investors can use their ownership stake and ability to vote to monitor firms and ensure conformity with their views on governance structures. Alternatively, it is also possible the passive investors' influence is not the result of them being active owners. Instead, passive investors' concentrated ownership might facilitate activism by others, such as hedge funds, by lowering the costs for other activists attempting to coordinate votes against management (Brav, Jiang, Partnoy, and Thomas, 2008; Bradley,

Brav, Goldstein, and Jiang, 2010). In this section, we investigate these two possible channels.

5.1. The power of passive investors' "voice"

To address whether passive investors exercise voice and influence firms' governance through their large voting blocs, we first analyze 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). To assess whether passive institutions influence voting outcomes, we estimate Eq. (1) with the dependent variable defined as the average percentage of shares that vote in support of management proposals.

Consistent with an increased monitoring of managers and with passive investors exercising voice, we find that greater ownership by passive funds is associated with less support for management proposals (Table 8, columns 1–3). The estimated coefficients are negative and statistically significant (at the 1% level). A one standard deviation increase in ownership by passive funds is associated, on average, with about a 0.75 standard deviation decline in support for management proposals. Consistent with passive investors being active in monitoring managers, management appears to be confronted with a more contentious shareholder base when passive funds, which are less able to vote with their feet, make up a larger percentage of the ownership.

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 potentially attributed to the relatively small number of companies that make such changes following their initial public offering; on average, only about 0.9% of firms remove a dual class share structure each year in our sample.

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 funds is not associated with a change in the total number of management proposals, and we find little evidence of an association with the composition of proposals. 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.

We next analyze support for governance-related shareholder proposals. While these proposals are non-binding, they potentially increase pressure on boards to make changes to their firms' governance structure (Del Guercio and Hawkins, 1999). If passive investors use such votes to exercise voice and influence, we might expect to observe an increase in support for such proposals.

In further support of passive investors exercising voice via their votes, we find evidence that ownership by passive funds is associated with an overall increase in support for governance-related shareholder proposals. On average, a one standard deviation increase in ownership by passive funds is associated with a 0.49–0.65 standard deviation increase in support for governance proposals (Table 8, columns 4–6). While the increase in support is only statistically significant at the 10% level when adding second- or third-order polynomial controls (p-Values 0.062 and 0.064, respectively), the implied magnitudes are economically large. The lower statistical significance likely reflects the relatively small number of such governance proposals. Similar to management proposals, we find no systematic relation between ownership by passive funds and differences in the types of shareholder proposals voted on.

5.2. No increased activism by others

An alternative mechanism by which passive ownership might influence firms' governance structure is by facilitating activism by other, non-passive investors. In particular, the size and concentration of passive investors' ownership stakes can increase activist investors' ability to rally support for their demands (Brav, Jiang, Partnoy, and Thomas, 2008; Bradley, Brav, Goldstein, and Jiang, 2010). Such added pressure from activist investors might also explain a number of the governance differences we observe. In other words, is it possible that the observed differences in governance are not driven by passive investors being engaged owners, but rather, driven by their ownership stake making it easier for others to engage in activism?

We find no evidence, however, that greater ownership by passive mutual funds is associated with more activism by non-passive institutions; instead, we find evidence of *less* activism by non-passive institutions, consistent with passive investors monitoring managers and reducing the need for activism by other investors. To demonstrate this, we estimate Eq. (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,

Table 9

Ownership by passive investors and hedge fund activism.

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

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

where Y_{it} is an indicator equal to one 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), scaled by its sample standard deviation, $Passive\%_{it}$ is the percentage of shares outstanding owned by passively managed mutual funds (as defined in Section 2.1 of the text) for stock i at the end of September in year t scaled by its sample standard deviation, $Mktcap_{it}$ 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. 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 holdings data from Thomson Reuters Mutual Fund Holdings Database 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 and reported in parentheses. The symbols * and ** indicate significance at the 10% and 5% levels, respectively.

Dependent variable =	Indicator for hedge fund activism event		
	(1)	(2)	(3)
Passive %	−0.131*	−0.130*	−0.162**
	(0.0721)	(0.0718)	(0.0805)
Bandwidth	250	250	250
Polynomial order, *N*	1	2	3
Float control	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
# of firms	1,654	1,654	1,654
Observations	4,415	4,415	4,415

Jiang, and Kim (2010), and zero otherwise.[23] These estimates are reported in Table 9. The point estimates are negative and statistically significant. We find that a one standard deviation increase in passive fund ownership is associated with a 0.13–0.16 standard deviation (i.e., 1.6–2.0 percentage point) decline in the likelihood of hedge fund activism. 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 1.6%.[24]

While the observed decline in activism by non-passive institutions is consistent with passive investors successfully affecting governance outcomes and reducing the need for activism by others, it does not negate the possibility that the concentration of passive institutions' ownership stakes increases the *threat* of activism by others, or that this threat increases the influence of passive

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[23] 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.

[24] In further support that the observed differences in governance are not driven by an increase in activism by other, non-passive investors, we find no evidence that firms with greater passive ownership are more likely to be the target of a takeover attempt, another mechanism by which activists might exercise influence.

investors' "voice." Concerned about an increased threat of activism, managers might be particularly responsive to the views of passive investors and be taking actions 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.[25]

6. 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.

6.1. 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 takeover defenses, and equal voting rights 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 might 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 might 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 funds is related to an overall improvement in firms' future performance, as measured using firms' ROA. Although passive fund 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 likely because improvements in performance can take time to manifest, and one would not expect to find a relation between changes in passive fund 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 one standard deviation increase in passive fund ownership is associated with about a 0.31–0.41 standard deviation increase in long-term ROA. In unreported estimates, we also find that passive fund ownership is positively associated with Tobin's *Q*, another commonly used measure of firm performance.[26]

6.2. 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 the need to properly reward and incentivize managers while avoiding "excessive" pay (see McNabb, 2014 and Appendix). To assess whether passive fund ownership affects CEO compensation structure, we examine total CEO pay, its composition, and the sensitivity of CEO pay to stock price movements.

We find little evidence that ownership by passive funds is associated with a difference in overall managerial pay or its composition. In unreported analysis, we find that while *Passive%* is negatively associated with total pay, the estimates are not statistically significant except in wider bandwidths. We also find little evidence that passive fund 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 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 relatively little impact on 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 non-binding votes on executive pay packages, potentially provides an added mechanism for passive investors to influence compensation decisions.

6.3. Cash, dividend, financing, and investment policies

There is an extensive literature addressing the relation between corporate ownership structure and corporate policies; for example, agency theories suggest that better monitoring by shareholders might lead to changes in leverage,

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[25] 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 discussions every year" that it is "frequently able to accomplish as much—or more—through dialogue" as through voting (see Booraem, 2014). 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). Earlier findings regarding activism by TIAA-CREF also confirm the importance and impact of such private negotiations (Carleton, Nelson, and Weisbach, 1998).

[26] 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 7.1.

Table 10
Ownership by passive investors and firms' return on assets.

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

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

where Y_{it} is the *ROA* for firm i in year t scaled by its sample standard deviation, *Passive%* is the percentage of shares outstanding owned by passively managed mutual funds (as defined in Section 2.1 of the text) for stock i at the end of September in year t scaled by its sample standard deviation, $Mktcap_{it}$ 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. 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 specification in columns 1–3 is 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 data consist of firms in the two Russell indexes for which we obtain holdings data from Thomson Reuters Mutual Fund Holdings Database 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-order polynomial controls for *Ln(Mktcap)*. Standard errors, ε, are clustered at the firm level and reported in parentheses. *** indicates significance at the 1% level.

Dependent variable =	ROA					
	(1)	(2)	(3)	(4)	(5)	(6)
Passive %	−0.028	−0.015	0.035	0.304***	0.310***	0.414***
	(0.098)	(0.093)	(0.105)	(0.111)	(0.106)	(0.121)
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 movers	No	No	No	Yes	Yes	Yes
# of firms	1,600	1,600	1,600	1,600	1,600	1,600
Observations	4,291	4,291	4,291	4,291	4,291	4,291

acquisitions, cash levels, and payout policies (Jensen, 1986; La Porta, Lopez-de-Silanes, and Shleifer, 2000). To examine whether ownership by passive mutual funds is associated with differences in these other corporate policies, we estimate Eq. (1) with standard measures of financing, investment, cash, and dividend policies as the outcome variable.

We find relatively little evidence that ownership by passive funds is associated with corporate policies related to investment, capital structure, or cash holdings. In unreported results, we find no difference in firms' leverage, capital expenditures, R&D expenses, cash-to-asset ratio, or acquisitions. These findings are consistent with anecdotal evidence that passive investors might lack the resources necessary to research and influence corporate policies that are inherently more firm-specific. We do, however, find weak evidence that passive ownership is associated with higher dividends. In unreported analysis, we find that a one standard deviation increase in *Passive%* is associated with about a 0.15 standard deviation increase in firms' dividend yield (significant at the 10% level in some specifications). We find qualitatively similar results if we instead use a payout ratio and scale firms' annual dividends by their net income, but the estimates are not statistically significant at conventional levels.

7. 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, to varying the sample bandwidth around the threshold, to using alternative definitions of passive institutional ownership as our key explanatory variable, or to using end-of-May market cap rankings to select our sample of stocks each year. We also address the

possibility of a selection bias around the Russell 1000/2000 threshold, particularly for the subsample of observations covered by ISS databases.

7.1. 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 Russell 1000/2000 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 except through its effect on passive ownership. 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.[27]

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 Table A.4, where we re-estimate

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[27] 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 Investments, 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 of 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.

our main IV regressions for the period 1998–2006 using the 250 bandwidth with third-order polynomial controls for *Ln(Mktcap)* after replacing the CRSP market cap with the Russell-provided market cap for the years 2002–2006. The estimates are nearly the same as before. Our findings are also robust to instead using the Compustat security monthly file to determine end-of-May market cap (see Table A.5).

Our findings are also robust to including various controls. Adding two-digit Standard Industrial Classification (SIC) industry fixed effects to the specification does not affect our findings (see Table A.6). Our findings are also largely unaffected if we add controls to account for firms that moved from the Russell 1000 to the Russell 2000 that year, and vice versa. If such switchers differ in other dimensions and represent a disproportionate share of either index, this could affect our earlier estimates. However, all of the findings are robust to the inclusion of these controls (see Table A.7). In unreported analysis, 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 Fig. A.1, in which 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 3–10. 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 might be correlated with firm" end-of-May market cap, we do not find an association between passive ownership and our outcomes of interest in placebo IV or reduced-form 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, nor do we find any of our findings in a reduced-form estimation of the outcomes onto *R2000*. 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.

7.2. Robustness to alternative definitions of passive ownership

For our analysis above, we measure the ownership stake of passive investors by summing up the ownership of mutual funds we classify as passively managed. A key advantage of using the Thomson Reuters Mutual Fund Holdings Database is that it allows for a precise measure of passive ownership.

A disadvantage of the fund-level data, however, is that it misses the holdings of passive institutional investors that do not manage mutual funds or Exchange Traded Funds (ETFs). The Thomson Reuters S12 mutual fund data we use exclude holdings by banks, insurance companies, and pension funds, some of which might also adopt passive investment strategies. While the exclusion of these passive institutions does not affect the validity of our IV estimation, it does mean one must be more careful in interpreting the IV point estimates. In particular, attempting to back out the implied change in governance structure for a given percentage change in passive ownership might lead to an overestimation of the actual economic magnitude of interest.[28] To avoid this potential concern, we scale our measure of *Passive%* by its sample standard deviation so that point estimates instead reflect the observed difference in governance for a one standard deviation difference in passive fund ownership. Under the assumption that the standard deviation change in passive fund ownership for stocks assigned to the Russell 2000 would be similar with the inclusion of any passive investors not captured by the S12 data, the point estimates we obtain in the scaled regression will accurately reflect the economic magnitude of interest.

Using a broader measure of passive ownership, however, has no effect on our findings. To illustrate this, we obtain data on institutional holdings from the Thomson Reuters Institutional Holdings (13F) Database. Any financial institution exercising discretionary management of investment portfolios over $100 million in qualified securities is required to report its aggregate holdings quarterly to the SEC using Form 13F, and consistent with this capturing a larger share of institutional ownership than the S12 data, we find that institutional holdings account for about 70% of market capitalization compared to the 25% of market capitalization accounted for by mutual funds in the S12 data. We then classify institutions as either passive or active using Bushee's (2001) classification of institutions. In particular, we classify "quasi-index" institutions as passive and "transient" or "dedicated" institutions as active.[29] Using this alternative measure of passive and active ownership, we repeat our first-stage and IV estimations. These estimates are reported in Tables 11 and 12. As further evidence that only passive investors adjust their holdings to index assignment, our first-stage estimates only detect an increase in "quasi-index" ownership (which includes some of the largest passive investors, like Vanguard, State Street, and Barclay's Bank) and no increase in "transient" or "ded-

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[28] For example, if the reduced-form estimation of board independence detects a 4.87 percentage point increase in the share of directors classified as independent for stocks in the Russell 2000 and the first stage estimation detects a 0.94 percentage point increase in holdings by passively managed mutual funds, then the IV estimate for board independence will equal $4.87/0.94 = 5.18$. In other words, the IV estimate will indicate that a one percentage point change in passive ownership causes a 5.18 percentage point increase in board independence. But if the true increase in passive ownership for stocks assigned to the Russell 2000, after accounting for passive investors not accounted for in the mutual fund data, is instead 2.1 percentage points, then the true effect of a one percentage point increase in passive ownership on board independence would be $4.87/2.1 = 2.32$ percentage points.

[29] To avoid changes in the classification of an institution over time, we use Bushee's "permanent" classification. Our findings, however, are 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.

Table 11

Impact of index assignment on institution-level (13F) stock 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

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

where $R2000_{it}$ is a dummy variable equal to one 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, N is the polynomial order we use to control for $Ln(Mktcap_{it})$, $Float_{it}$ is the float-adjusted market value of equity (provided by Russell) at June 30 in year t, and δ_t are year fixed effects. $Ownership\%_{it}$ measures institution-level (13F) ownership (in percent) for stock i at the end of September in year t. In this table we use four different definitions for $Ownership\%$ for stock i: (1) the percentage of shares outstanding owned by all institutional investors; (2) the percentage of shares outstanding owned by "quasi-index" institutions, 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" institutions as classified by Bushee. The Bushee classifications are defined in Section 7.2 of the text. The sample consists of the top 250 firms in the Russell 2000 index and bottom 250 firms of the Russell 1000 index (i.e., bandwidth = 250) for which we obtain holdings data from Thomson Reuters Institutional Holdings (13F) Database and which we match with data from the monthly CRSP file. The model is estimated over the 1998–2006 period using a polynomial order control for $Ln(Mktcap)$ of $N = 3$. Standard errors, ε, are clustered at the firm level and reported in parentheses. *** indicates significance at the 1% level.

Dependent variable =	Percent of firm's common shares held by:			
	All institutions	Quasi-index	Dedicated	Transient
	(1)	(2)	(3)	(4)
R2000	1.354	2.381***	−0.539	−0.445
	(1.517)	(0.748)	(0.891)	(0.845)
Bandwidth	250	250	250	250
Polynomial order, N	3	3	3	3
Float control	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
# of firms	1,633	1,633	1,633	1,633
Observations	4,357	4,357	4,357	4,357
R-squared	0.24	0.26	0.02	0.09

Table 12

Robustness of IV estimates to using passive indicator based on institution-level (13F) stock ownership.

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 our governance and corporate outcome variables where passive ownership is measured using the percentage of stock held by "quasi-index" institutions, as classified by Bushee (2001) and defined in Section 7.2 of the text. The estimation and outcomes are the same as in Tables 4–10, except $Passive\%$ is replaced by $Quasi\text{-}index\%$, the share of market cap held by quasi-index institutions scaled by its sample standard deviation. The dependent variables are defined in Table A.1, and the model is estimated over the 1998–2006 period using a bandwidth of 250 firms around the Russell 1000/2000 threshold and a third-order polynomial 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 and reported in parentheses. 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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quasi-index %	1.197***	0.885*	0.958**	−2.866**	−1.148**	1.297*	−0.580*	1.803**
	(0.388)	(0.479)	(0.473)	(1.170)	(0.516)	(0.680)	(0.336)	(0.899)
Bandwidth	250	250	250	250	250	250	250	250
Polynomial order, N	3	3	3	3	3	3	3	3
Float control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of firms	1,073	1,160	1,047	1,047	768	125	1,633	1,586
Observations	2,840	2,940	1,847	1,847	1,279	200	4,357	4,246

icated" ownership. Moreover, as shown in Table 12, our IV estimates when using *Quasi-index%* remain qualitatively similar.[30]

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 13F holdings by Barclays Bank, State Street, and Vanguard, we get similar findings. In unreported first-stage estimates, we find

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[30] Similar to before, one must be cautious in interpreting the economic magnitudes of these estimates. Because Bushee (2001) "quasi-index" classification includes some active investors and actively managed mutual funds, the first-stage estimates for the implied standard deviation change in *Quasi-index%* likely understate the true standard deviation change in passive holdings. In particular, the 2.3 percentage point increase in quasi-index holdings found in Table 11, column 2 corresponds to about a 0.14 standard deviation change in *Quasi-index%*, which is considerably smaller

than the 0.5 standard deviation change detected when using a more precise measure of passive holdings. This smaller first-stage estimate will cause the IV estimates to be inflated when using *Quasi-index%* scaled by its sample standard deviation as the explanatory variable to be instrumented.

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 more than half of the increase in *Quasi-index* ownership shown in Table 11. Moreover, our IV estimations remain large and 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 Table A.8. 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.

7.3. Robustness to alternative sampling choices

In our main analysis, we select our sample to be the 250 stocks with the smallest portfolio weights in the Russell 1000 and the 250 stocks with the largest portfolio weights in the Russell 2000. Our findings, however, are not sensitive to instead using end-of-May market caps to determine the sample of stocks each year. In particular, we can instead rank stocks based on their end-of-May market cap, as calculated using CRSP, and select the sample for each year of the sample using firms ranked 750th through 1,250th that year. An advantage of this latter approach is that it eliminates the risk that Russell's float-adjusted reweighting of stocks within an index affects our findings. A disadvantage of this approach, however, is that we are no longer necessarily comparing the very bottom firms of the Russell 1000 against the very top firms of the Russell 2000, which is where we would expect to find the biggest difference in passive ownership (and hence, outcomes) to occur. This sampling choice, however, has little impact on our IV estimates. While the first-stage estimates are expectedly smaller in magnitude when we use end-of-May market caps to rank stocks and select our sample each year (coefficient $= 0.383$, t-stat $= 9.54$), the IV estimations are largely unchanged (see Table A.9).

7.4. Ruling out potential sample selection biases

One potential concern with our analysis is the possibility of systematic differences (beyond market capitalization, which we control for) in the type of stocks on the two sides of the Russell 1000/2000 threshold. For example, one might worry that "fallen angels" (stocks experiencing significant declines in stock price) are more likely to appear in the Russell 2000, while "rising stars" (stocks experiencing significant increases in stock price) are more likely to appear in the Russell 1000. Additionally, this concern could be particularly relevant for our analysis that uses the ISS data, which is largely limited to firms in the S&P 1500, if there are systematic differences in the likelihood of fallen angels or rising stars from the Russell 2000 sample being included in the S&P 1500 (and hence, in the ISS sample) relative to the likelihood of fallen angels or rising stars from the Russell 1000 sample being included in the S&P 1500. If present, such difference could cause a violation of the exclusion restriction.

However, we do not find significant evidence of differences in the lagged returns (prior to reconstitution)

between the stocks on different sides of the Russell 1000/2000 threshold. Specifically, we find no evidence that "fallen angels" or "rising stars" are disproportionately represented in either index, including the subsample covered by ISS. To show this, we create indicator variables for "rising stars" and "fallen angels" that equals one if a stock's return is in the top or bottom 5% of the sample for the 12 months before reconstitution (i.e., end-of-May in year t-1 to end-of-May in year t), respectively. We do not find statistically significant differences in the proportion of fallen angels and rising stars in the Russell 1000 versus the Russell 2000, either in the full sample or in the sample of observations covered by ISS. Moreover, we do not find evidence of a significant difference in either the lagged stock return or lagged change in stocks' end-of-May market cap ranking between the stocks on either side of the Russell 1000/2000 threshold for the sample observations covered by ISS. While there is evidence in the full sample that stocks at the top of the Russell 2000 have *higher* average lagged stock returns, our main second-stage results are robust to controlling for past stock price returns (see Table A.10) or other indicators for a large change in market cap over the past year.

Finally, any selection into the ISS database based on dual class share structures cannot easily explain our findings regarding dual class structures. Since S&P requires firms to have a public float of at least 50% of the stock to be added to the S&P 1500, companies with dual class structures might be less likely to be included in the S&P 1500. However, because our analysis is limited to the subsample of firms covered by ISS, our estimates indicate that among firms covered by ISS, more passive ownership is associated with a firm being less likely to have a dual class share structure. In other words, any type of selection (if it existed) would not be a problem for our analysis.

8. Conclusion

Institutions that manage passive funds, like Vanguard and State Street, are an increasingly important component of U.S. stock ownership, and the impact of their growth on firm-level governance is widely debated. Despite arguments that they might be lazy investors that lack both the motivation and resources to monitor managers, there are multiple reasons why passive investors might have a vested interest in affecting firms' governance structures and performance and why their large ownership stakes might make them an influential voice in decisions pertaining to firms' governance structures.

To examine whether passively managed mutual funds 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 about a 66% difference in passive ownership for stocks at the top of the Russell 2000 relative to stocks at the bottom of the Russell 1000. Thus, we instrument passive institutional ownership with an indicator for being assigned to the Russell 2000 in a given year 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 owners in the traditional sense of accumulating or selling shares in a target company with the express purpose of influencing management, they are not passive owners either. In particular, we find that ownership by passively managed mutual funds is associated with more independent directors on a board, fewer takeover defenses, and more equal voting rights, as captured by a firm being less likely to have a dual class share structure. The observed differences in actual governance structures suggest that passive institutions are attentive to firms' corporate governance, and that they use their large voting blocs to exercise voice and exert influence. For example, we find that higher passive fund ownership is associated with less support for management proposals and greater support for shareholder-initiated governance proposals. Engagement by passive mutual funds also appears to reduce the need for activism by other, non-passive investors; we find that companies with greater passive fund ownership exhibit improvements in long-term performance and are less likely to be targeted for activism by a hedge fund.

Our findings, however, do not resolve the ongoing debate regarding the value implications of various governance structures, including board independence, takeover defenses, and equal voting rights for shareholders, and whether the optimal governance structure might 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 (Davis and Kim, 2007), additional analysis regarding these questions would seem to be a promising direction for further research.

Appendix A. Excerpts from fund governance/voting policies

In this appendix, we provide excerpts from the historical voting policies of various institutional investors that offer index-related investment products. These proxy-voting policies were all obtained from fund prospectuses issued in late 2003 and early 2004 shortly after the SEC first required the filing of such voting policies on July 1, 2003. Four common themes of these governance/voting policies are (1) to withhold support or vote against boards that are not sufficiently independent, (2) broadly oppose takeover defenses, like poison pills, restrictions on shareholders' ability to call a special meeting, and classified boards, (3) oppose unequal voting rights (i.e., dual class share structures), and (4) push for executive compensation that is tied to performance but not excessive.
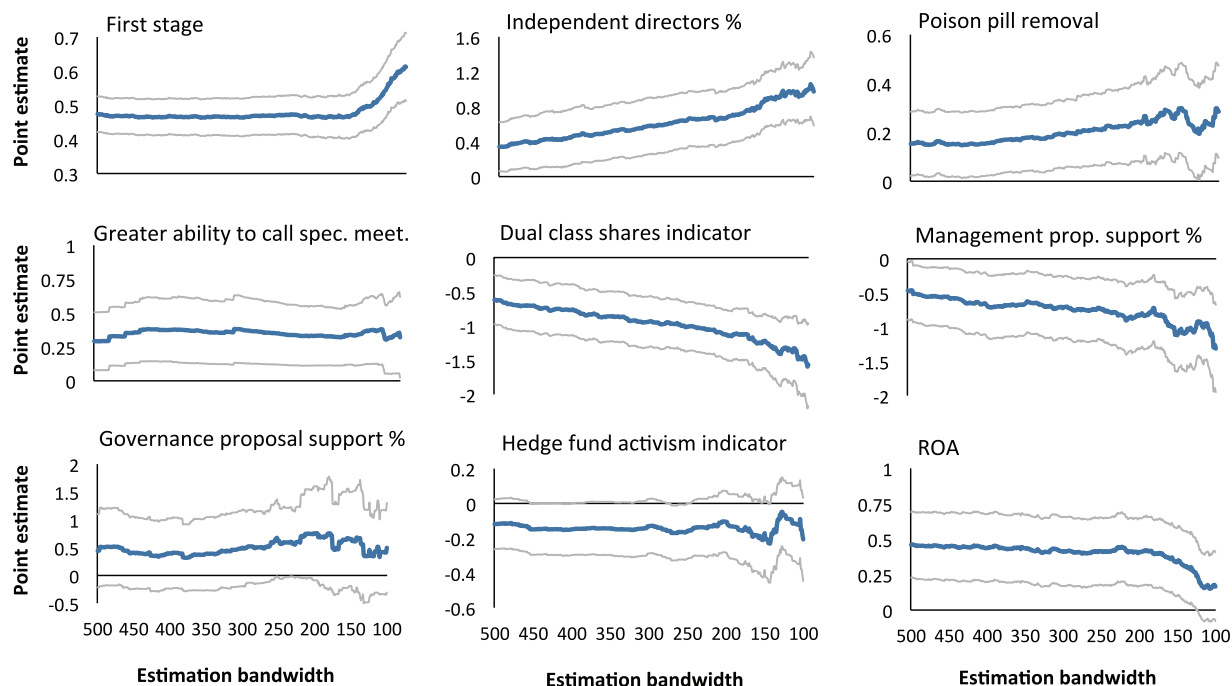
Fig. A.1. First stage and IV point estimates in the 100 through 500 bandwidths around the Russell 1000/2000 threshold. This figure plots the point estimate and 95th percentile confidence intervals by estimation bandwidth choice for the outcomes reported in Tables 3–10. Variable definitions are given in Table A.1., and the estimations and samples are the same as in Tables 3–10 except the estimation bandwidth is varied between 100 and 500 firms around the Russell 1000/2000 threshold. A third-order polynomial control for *Ln(Mktcap)* is included in all estimations.

Table A.1
Variable definitions.

Variable name	Source	Definition
R2000	Russell investments	Indicator equal to one if firm is in the Russell 2000
Mutual fund ownership %	Thomson Reuters S12 files	% of shares outstanding held by mutual funds in September of year t
Passive %	Thomson Reuters S12 files	% of shares outstanding held in September of year t by passively managed funds
Active %	Thomson Reuters S12 files	% of shares outstanding held in September of year t by actively managed funds
Unclassified %	Thomson Reuters S12 files	% of shares outstanding held in September of year t by unclassified funds
Independent director %	Riskmetrics (Directors)	% of board seats held by directors classified as independent by Riskmetrics
Poison pill removal	Shark Repellent (FactSet)	Indicator equal to one if poison pill is withdrawn or allowed to expire at time t
Greater ability to call spec. meet.	Riskmetrics (Governance)	Indicator equal to one if shareholders better able to call a special meeting at time t
Indicator for dual class shares	Riskmetrics (Governance)	Indicator equal to one 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 shareholder governance proposals
Indicator for hedge fund activism	Brav, Jiang, and Kim (2010)	Indicator equal to one if a firm has an activism event at time t
ROA	Compustat	Net income (ni) / total assets (at)
Institutional ownership %	Thomson Reuters 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 institutions in September of year t
Transient %	Brian Bushee website	% of shares outstanding held by transient institutions in September of year t

Table A.2
First-stage estimation for ownership by actively managed and unclassified mutual funds.
This table reports estimates of our first-stage regression of ownership by actively managed and unclassified mutual funds onto an indicator for membership in the Russell 2000 index plus additional controls over the 1998–2006 sample period. The specification is the same as in Table 3, except that the dependent variable in columns 1–3 is now $Active\%_{it}$, which is the percentage of shares outstanding owned by actively managed mutual funds for stock i at the end of September in year t scaled by its sample standard deviation, and the dependent variable in columns 4–6 is now $Unclassified\%_{it}$, which is the percentage of shares outstanding owned by unclassified mutual funds for stock i at the end of September in year t scaled by its sample standard deviation. Both $Active\%$ and $Unclassified\%$ are defined in Table A.1. Standard errors are clustered at the firm level and reported in parentheses.

Dependent variable =	Active % scaled by its sample standard deviation			Unclassified % scaled by its sample standard deviation		
	(1)	(2)	(3)	(4)	(5)	(6)
R2000	0.055	0.049	0.011	0.028	0.020	0.004
	(0.055)	(0.054)	(0.056)	(0.047)	(0.046)	(0.047)
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	1,654	1,654	1,654	1,654	1,654	1,654
Observations	4,415	4,415	4,415	4,415	4,415	4,415
R-squared	0.12	0.12	0.12	0.08	0.09	0.09

A.1. iShares: proxy voting guidelines[31]

"The Company has adopted as its proxy voting policies the proxy voting guidelines of BGFA [Barclays Global Fund Advisors], the investment advisor to each Fund. The Company has delegated to BGFA the responsibility for voting proxies on the portfolio securities held by each Fund. Therefore, the remainder of this section discusses BGFA's proxy voting guidelines…

When voting proxies, BGFA attempts to ensure that companies follow practices that advance their economic value and allow the market to place a proper value on their assets. With respect to certain specific issues:

- BGFA generally supports management in the election of directors and generally supports proposals that strengthen the independence of boards of directors.

- BGFA generally does not support proposals on social issues that lack a demonstrable economic benefit to the issuer and the Fund investing in such issuer.
- BGFA generally votes against anti-takeover proposals and proposals which would create additional barriers or costs to corporate transactions."

A.2. State street global advisors: proxy voting policies and procedures[32]

"For most issues and in most circumstances, we abide by the following general guidelines…

FM votes in support of management on the following ballot items…

- Elimination of cumulative voting…
- Capitalization changes which eliminate other classes of stock and voting rights…

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[31] http://www.sec.gov/Archives/edgar/data/930667/000119312503100400/d485bpos.txt

[32] http://www.sec.gov/Archives/edgar/data/826686/000104746904004745/a2128691z485bpos.txt

Table A.3

This table reports estimates of our first-stage regression of passive ownership onto an indicator for membership in the Russell 2000 index plus additional controls over the 1998–2006 sample period. The specification in Panel A 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, 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 4, 6, and 7. The specification in Panel B 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. Standard errors are clustered at the firm level and reported in parentheses. *** indicates significance at the 1% level.

Dependent variable =	Passive % scaled by its sample standard deviation								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: First-stage estimation for Tables 4, 6, and 7									
R2000	0.423***	0.428***	0.412***	0.624***	0.628***	0.596***	0.551***	0.536***	0.510***
	(0.031)	(0.031)	(0.030)	(0.040)	(0.041)	(0.046)	(0.046)	(0.046)	(0.043)
Bandwidth	250	250	250	250	250	250	250	250	250
Polynomial order, N	1	2	3	1	2	3	1	2	3
Float control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1st stage estimate for…	Table 4, Col. (1)	Table 4, Col. (2)	Table 4, Col. (3)	Table 6, Col. (1)	Table 6, Col. (2)	Table 6, Col. (3)	Table 6, Col. (4) and Table 7, Col. (1)	Table 6, Col. (5) and Table 7, Col. (2)	Table 6, Col. (6) and Table 7, Col. (3)
# of firms	1,082	1,082	1,082	1,164	1,164	1,164	1,050	1,050	1,050
Observations	2,871	2,871	2,871	2,957	2,957	2,957	1,858	1,858	1,858
R-squared	0.74	0.74	0.74	0.50	0.50	0.50	0.67	0.67	0.67
Panel B: First-stage estimation for Table 8									
R2000	0.420***	0.415***	0.373***	0.774***	0.696***	0.754***			
	(0.036)	(0.036)	(0.041)	(0.198)	(0.231)	(0.232)			
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	775	775	775	127	127	127			
Observations	1,288	1,287	1,287	202	202	202			
R-squared	0.74	0.74	0.74	0.59	0.60	0.61			

Table A.4

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 investors 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 4–10, 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 *Passive%* 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 third-order polynomial 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 and reported in parentheses. 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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Passive %	0.487***	0.194**	0.387***	−0.482**	−0.694***	0.287	−0.156*	0.540***
	(0.147)	(0.095)	(0.135)	(0.187)	(0.237)	(0.340)	(0.0891)	(0.133)
Bandwidth	250	250	250	250	250	250	250	250
Polynomial order, N	3	3	3	3	3	3	3	3
Float control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of firms	1,082	1,164	1,050	1,050	775	127	1,654	1,600
Observations	2,871	2,957	1,858	1,858	1,288	202	4,415	4,291

- Elimination of pre-emptive rights for share issuance of less than a given percentage (country specific - ranging from 5% to 20%) of the outstanding shares
- Elimination of "poison pill" rights…

- Stock option plans which are incentive based and not excessive
- Other stock-based plans which are appropriately structured
- Reductions in super-majority vote requirements…

Table A.5
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 investors 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 4–10, except that $Mktcap_{it}$ is the Compustat market value of equity of stock i measured at May 31 in year t. We instrument $Passive\%$ 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 third-order polynomial 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 and reported in parentheses. 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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Passive %	0.650***	0.176**	0.299***	−1.139***	−0.796***	0.565*	−0.134*	0.417***
	(0.169)	(0.073)	(0.112)	(0.183)	(0.243)	(0.294)	(0.081)	(0.124)
Bandwidth	250	250	250	250	250	250	250	250
Polynomial order, N	3	3	3	3	3	3	3	3
Float control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of firms	1,024	1,085	992	992	733	119	1,549	1,496
Observations	2,739	2,791	1,764	1,764	1,225	191	4,171	4,052

Table A.6
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 investors on our governance and corporate outcome variables when we add two-digit SIC industry fixed effects. The data, outcome variables, and specification are the same as in Tables 4–10 except that we now also include two-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 third-order polynomial 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 and reported in parentheses. 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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Passive %	0.537***	0.182**	0.349***	−0.781***	−0.660***	0.478	−0.161*	0.453***
	(0.151)	(0.0795)	(0.116)	(0.178)	(0.230)	(0.336)	(0.0840)	(0.122)
Bandwidth	250	250	250	250	250	250	250	250
Polynomial order, N	3	3	3	3	3	3	3	3
Float control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Two-digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of firms	1,080	1,164	1,050	1,050	775	127	1,654	1,600
Observations	2,871	2,957	1,858	1,858	1,288	202	4,415	4,291

Table A.7
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 investors 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 4–10 except that we now 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 model is estimated over the 1998–2006 period using a bandwidth of 250 firms around the Russell 1000/2000 threshold and a third-order polynomial 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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Passive %	0.514***	0.201***	0.296***	−1.090***	−0.953***	0.663**	−0.287***	0.414***
	(0.170)	(0.077)	(0.113)	(0.193)	(0.250)	(0.324)	(0.097)	(0.121)
Bandwidth	250	250	250	250	250	250	250	250
Polynomial order, N	3	3	3	3	3	3	3	3
Float control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls for movers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of firms	1,080	1,164	1,050	1,050	775	127	1,654	1,600
Observations	2,871	2,957	1,858	1,858	1,288	202	4,415	4,291

Table A.8

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

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

where: Y_{it} is the outcome variable for firm i in year t; $BSV\%_{it}$ 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; $Float_{it}$ 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 $BSV\%$ 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 holdings data from Thomson Reuters Institutional Holdings (13F) Database 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 third-order polynomial 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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BSV %	0.673***	0.249***	0.432***	−1.293***	−0.792***	0.838*	−0.204**	0.596***
	(0.159)	(0.0920)	(0.152)	(0.262)	(0.265)	(0.496)	(0.0967)	(0.184)
Bandwidth	250	250	250	250	250	250	250	250
Polynomial order, N	3	3	3	3	3	3	3	3
Float control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of firms	1,073	1,160	1,047	1,047	768	125	1,633	1,586
Observations	2,840	2,940	1,847	1,847	1,279	200	4,357	4,246

Table A.9

Robustness of findings to using end-of-May market cap rankings to select sample.

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 our governance and corporate outcome variables when we instead choose our sample using end-of-May market cap rankings. The data, outcome variables, and specification are the same as in Tables 4–10 except that we choose our sample by ranking stocks within a year using their end-of-May CRSP market cap and selecting our sample to only include stocks ranked 750th largest through 1,250th largest each year. The model is estimated over the 1998–2006 period using a third-order polynomial 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 and reported in parentheses. 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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Passive %	0.448**	0.186	0.378**	−1.800***	−0.748**	0.352	−0.249**	0.353**
	(0.202)	(0.123)	(0.186)	(0.366)	(0.333)	(0.304)	(0.114)	(0.175)
Bandwidth	250	250	250	250	250	250	250	250
Polynomial order, N	3	3	3	3	3	3	3	3
Float control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Two-digit industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of firms	1,073	1,157	1,053	1,053	772	119	1,626	1,593
Observations	2,949	2,966	1,886	1,886	1,294	195	4,431	4,325

FM votes against management on the following items…

- Capitalization changes that add "blank check" classes of stock or classes that dilute the voting interests of existing shareholders…
- Anti-takeover and related provisions that serve to prevent the majority of shareholders from exercising their rights or effectively deter appropriate tender offers and other offers
- Amendments to bylaws which would require super-majority shareholder votes to pass or repeal certain provisions
- Elimination of Shareholders' Right to Call Special Meetings

- Establishment of classified boards of directors…
- Shareholder rights plans that allow the board of directors to block appropriate offers to shareholders or which trigger provisions preventing legitimate offers from proceeding
- Excessive compensation…
- Proposals requesting re-election of insiders or affiliated directors who serve on audit, compensation, and nominating committees…

FM votes in support of shareholders on the following ballot items…

- Establishment of an annual election of the board of directors

Table A.10

Robustness of findings to including control for a firm's lagged stock return.

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 our governance and corporate outcome variables when we add a control to account for a firm's stock return in the previous reconstitution year. Specifically, the data, outcome variables, and specification are the same as in Tables 4–10 except that we add one control to the specification: the stock return in the year prior to the determination of a stock's index assignment [i.e., from end-of-May in year *t*−1 to end-of-May 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 third-order polynomial 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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Passive %	0.675***	0.209**	0.355***	−1.021***	−0.711***	0.604*	−0.160*	0.466***
	(0.163)	(0.0846)	(0.119)	(0.184)	(0.268)	(0.326)	(0.0840)	(0.128)
Bandwidth	250	250	250	250	250	250	250	250
Polynomial order, N	3	3	3	3	3	3	3	3
Float control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control for lagged stock return	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of firms	1,075	1,111	1,046	1,046	746	126	1,537	1,483
Observations	2,856	2,855	1,850	1,850	1,252	201	4,185	4,068

- Mandates requiring a majority of independent directors on the Board of Directors and the audit, nominating, and compensation committees…
- Mandates that shareholder-rights plans be put to a vote or repealed…
- Repeals of various anti-takeover related provisions
- Reduction or elimination of super-majority vote requirements…"

A.3. Vanguard: proxy voting guidelines[33]

"The Board of Trustees (the Board) of each Vanguard fund that invests in stocks has adopted proxy voting procedures and guidelines to govern proxy voting by the fund. The Board has delegated day-to-day oversight of proxy voting to the Proxy Oversight Committee (the Committee), comprised of senior Vanguard officers and subject to the operating procedures and guidelines described below…

I. The board of directors
A. Election of directors

We believe that 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…

We 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.

II. Approval of independent auditors

We believe that the relationship between the company and its auditors should be limited primarily to the audit, although it may include certain closely related activities that do not, in the aggregate, raise any appearance of impaired independence. We will generally support management's recommendation for the ratification of the auditor, except in instances where audit and audit-related fees make up less than 50% of the total fees paid by the company to the audit firm. We will evaluate on a case-by-case basis instances in which the audit firm has a substantial non-audit relationship with the company (regardless of its size relative to the audit fee) to determine whether we believe independence has been compromised.

III. Compensation issues
A. Stock-based compensation plans

We believe that appropriately designed stock-based compensation plans, administered by an independent committee of the board and approved by shareholders, can be an effective way to align the interests of long-term shareholders and the interests of management, employees, and directors. Conversely, we oppose plans that substantially dilute our ownership interest in the company, provide participants with excessive awards, or have inherently objectionable structural features…

IV. Corporate structure and shareholder rights

We believe the exercise of shareholder rights, in proportion to economic ownership, to be a fundamental privilege of stock ownership that should not be unnecessarily limited. Such limits may be placed on shareholders' ability to act by corporate charter or by-law provisions, or by the adoption of certain takeover provisions. We believe that, in general, the market for corporate control should be allowed to function without undue interference from these artificial barriers.

Our positions on a number of the most commonly presented issues in this area are as follows:

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[33] http://www.sec.gov/Archives/edgar/data/105563/000093247104000415/wellington485b032004.txt

A. Shareholder rights plans (poison pills)

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...

B. Cumulative voting

We are generally opposed to cumulative voting under the premise that it allows shareholders a voice in director elections that is disproportionate to their economic investment in the corporation.

C. Supermajority vote requirements

We support shareholders' ability to approve or reject matters presented for a vote based on a simple majority. Accordingly, we will support proposals to remove supermajority requirements and oppose proposals to impose them.

D. Right to call meetings and act by written consent

We support shareholders' right to call special meetings of the board (for good cause and with ample representation) and to act by written consent. We will generally vote for proposals to grant these rights to shareholders and against proposals to abridge them.

E. Confidential voting

We believe that the integrity of the voting process is enhanced substantially when shareholders (both institutions and individuals) can vote without fear of coercion or retribution based on their votes. As such, we support proposals to provide confidential voting.

F. Dual classes of stock

We are opposed to dual class capitalization structures that provide disparate voting rights to different groups of shareholders with similar economic investments. As such, we will oppose the creation of separate classes with different voting rights and will support the dissolution of such classes.

V. Corporate and social policy issues

Proposals in this category, initiated primarily by shareholders, typically request that the company disclose or amend certain business practices. We generally believe that these are "ordinary business matters" that are primarily the responsibility of management and should be evaluated and approved solely by the corporation's board of directors. Often, proposals may address concerns with which we philosophically agree, but absent a compelling economic impact on shareholder value (e.g., proposals to require expensing of stock options), we will typically abstain from voting on these proposals. This reflects our 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 our investment and, we do not view management as responsive to the matter."

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