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Essays in Corporate Governance

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Jun Mok Kim

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Dedicated to my dad.

ABSTRACT OF THE DISSERTATION

Essays in Corporate Governance

for Olin Business School Graduate Students

by

Jun Mok Kim

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Professor Todd A. Gormley, Chair

This thesis consists of two essays that deal with institutional investors and corporate governance. In particular the first chapter studies the relationship between higher temperatures and institutions' proxy voting. Analyzing voting decisions by U.S. mutual funds, I find that heat exposure negatively correlates with voting against management. The findings concentrate on companies or shareholder proposals where a stockholding in the firm represents a larger share of an institution's portfolio. The heat-voting relationship is stronger when an institutional shareholder is experiencing unusually hotter temperatures. My results suggest potentially significant but hidden corporate governance implications of climate change.

The second chapter studies the association between institutions' attention to individual stocks and their active ownership positions. We find that institutions tend to vote in ways suggesting greater attention to stocks where they hold a larger active position. This association holds for institutions where voting decisions are centralized governance, including "The Big

Three," and is larger for illiquid stocks, where institutions' active funds are less able to exercise governance via exit. Our findings suggest that passive institutions' actively managed holdings enhance their incentive to be engaged stewards.

Chapter 1: Too Hot to Handle: Proxy Voting under Thermal Stress

"Heat, like gravity, penetrates every substance of the universe…"

- Joseph Fourier

1.1 Introduction

Does heat affect institutional investors? This question is an important one, for several reasons. First, there is a growing consensus that temperatures are rising, and high temperatures often have negative impacts on human societies (see, e.g., Dell, Jones, and Olken, 2009)[1]. Thus, an understanding of how heat might affect those who own and engage with firms can shed light on the mechanism through which high temperatures influence economic outcomes.

Second, institutional investors' potential to affect firm behavior has become substantial (French, 2008). For example, institutional ownership of U.S. corporations now exceeds 70% of the overall market, and the ownership has become increasingly concentrated in recent years: in 2017, while insiders and affiliates own 5.2% of the value-weighted average firm, a firm's top five institutional shareholders own 27.6% of shares (Lewellen and Lewellen, 2022a).

Third, we still have a limited understanding of whether experienced professional investors, who work in good-quality, climate-controlled, indoor spaces, are immune to outdoor climate. Some exceptions are the growing literature on the effect of sunlight on stock returns and institutional investors' trading decisions (e.g., Saunders, 1993; Hirshleifer and Shumway, 2003;

[1] See, also, recent research that documents the adverse causal impacts of extreme heat on aggregate output (e.g., Dell, Jones, and Olken, 2012; Burke, Hsiang, and Miguel, 2015a; Colacito, Hoffman, and Phan, 2019), firm performance (e.g., Pankratz, Bauer, and Derwall, 2022), and labor productivity (e.g., Graff Zivin and Neidell, 2014; Somanathan et al., 2021).

Goetzmann et al., 2015). The role of climate patterns, in general, and especially extreme heat in shaping institutions' behavior has been less explored.

In this paper, I provide direct evidence on the relationship between heat and institutional investors' behavior. The specific behavior of institutions I focus on is their monitoring activities via proxy voting. Proxy voting provides an important way for institutional shareholders to convey their views to boards and management of their portfolio companies, and it is becoming an increasingly important monitoring channel because of institutions' ever-greater ownership of U.S. public corporations (see, e.g., Dasgupta, Fos, and Sautner, 2021). At some level, it is obvious that weather-related environments can matter to voting decisions since humans (analysts) are involved in these stewardship activities (see BlackRock, 2021). Nevertheless, we still lack evidence on how these proxy voting decisions can be vulnerable to such a seemingly irrelevant consideration, heat, especially through behavioral mechanisms. The main result of this paper is to document the existence of systematic correlations between heat and institutional investors' proxy voting.

A growing literature has provided evidence suggesting that stress arising from higher temperatures could have various impacts on individuals' decision-making (see, e.g., Burke, Hsiang, and Miguel, 2015b; Almås et al., 2020). In my analysis, I focus on the impact of heat stress on risk preferences and mental resources. Scholars in economics and psychology have found that stress typically induces more risk aversion, and stress from higher temperatures depletes resources. The literature on stress, risk aversion, and mental depletion is discussed in the next section. The evidence suggests that institutional investors who are exposed to heat-induced stressful conditions might prefer the status quo of their portfolio firms. In proxy voting, institutional shareholders express their concerns or preferences about their portfolio companies' current activities or management by voting against management (see, e.g., McCahery, Sautner, and Starks, 2016). If hot weather and thermal stress strengthen a preference for the status quo, institutions might be less likely to question management and vote against them. Alternatively, if the voting process is mostly automatic and involves little human interactions, or if climate-controlled office working conditions mitigate the impact of outdoor temperature on workers, then weather conditions like hotter temperatures would have no explanatory value in predicting voting.

I construct a unique database from 2003 to 2020 that links heat and voting of a large sample of U.S. mutual fund families. I focus on shareholder-sponsored proposals because these are non-routine proposals in which the informational content of voting is more meaningful (see, e.g., Iliev and Lowry, 2015). My main independent variable is a dummy variable that equals one if an institutional investor votes on a proposal during their hottest (consecutive) 30-day window of the year. The hottest 30-day period is defined as the 30-day window whose average of daily mean temperatures is the highest in an investor's geographic area *that* year.

I find that institutional investors who are experiencing hot weather are less likely to vote against management. One interpretation of this phenomenon is that institutions seem to become more dependent or lenient toward management when the weather is hot. The economic magnitude is large: institutions who vote during the hot weather have roughly a 7 percent lower probability of voting against management. I control for proposal effects to adjust for any differences in institutions' voting pattern due to the nature of the proposal and fund family-by-year effects to adjust for unobserved, time-varying differences across fund families.

Next, I examine whether the relationship between higher temperatures and voting varies across different subsamples of proposals. Institutional investors are known to focus their attention on certain types of proposals (e.g., Iliev and Lowry, 2015; He, Huang, and Zhao, 2019). I focus on agendas in which management and the leading proxy advisor ISS disagree on vote recommendation (i.e., contentious proposals) and ones whose voting outcome is less certain (i.e., contested proposals); in both cases, institutions would have a greater need to exert monitoring efforts. A priori, it is unclear whether institutions might exhibit different heat-induced behaviors on these agendas. Intuitively, systematic biases or behavioral distortions that are abnormal, in general, are likely to be less salient on proposals that investors tend to pay more attention to. Another perspective, or an unawareness view, is that concentrated attention need not reduce those tendencies if investors do not even realize the fact that they can suffer from them. Consistent with the unawareness view, I find that institutions' inclination toward management does not vary across various types of proposals.

I also find that for proposals where only ISS's vote recommendation is available (i.e., no management recommendation is provided), institutions seem to increase their dependence on the proxy advisory firm when they vote during hotter periods. This result suggests that institutional investors might less actively monitor portfolio companies because heat stress diminishes attention.

In my next analysis, I show that the heat-voting association seems to be stronger for portfolio firms in which an institution has larger holdings. Prior studies suggest that institutions are more likely to pay attention to firms where they have larger stakes (e.g., Fich, Harford, and Tran, 2015). I find that institutional shareholders exhibit a greater tendency to rely on management during periods of higher temperatures when a stockholding in the firm represents a larger fraction of the institution's portfolio. Specifically, my analysis indicates that when the investment size, relative to overall portfolio, increases by one sample standard deviation, the tendency is about 135% stronger for these companies. These results suggest that institutions are likely to be most vulnerable on matters that they care about the most.

Given the growing concerns about climate change, I further explore whether institutional investors are more sensitive to particularly hot temperatures. Climate change is expected not only to raise average temperatures but worsen extreme climate events including making the intensity of heat waves stronger. It seems interesting, then, to ask how institutions would respond to unusual weather conditions. In fact, my regressions show that the relationship between higher temperatures and voting is significantly greater during a summer that is hotter than the average year. A 1°F hotter summer is associated with a 25% increase in the bias toward management relative to the average summer.

Finally, I document that adaptation through acclimatization appears to offset potential adverse impacts of heat exposure on voting. To show this, I classify U.S. states into several groups based on annual state temperature averages of the 30-year period from 1971 to 2000. I then assess whether institutions in warmer areas are less sensitive to elevated temperatures than ones located in other areas. I find that high temperatures in southern states such as Texas, Georgia, or Florida are less related to voting. This evidence suggests a potential adaptation to higher temperatures in those regions, which is consistent with a growing literature on the role of adaptation in reducing the potential impacts of climate (e.g., Graff Zivin, Hsiang, and Neidell, 2018).

Overall, my findings contribute to a growing literature that points to the role of thermal stress on people's decision making (e.g., Almås et al., 2020). In particular, my study is related to two recent studies of professional decision makers. The first is by Heyes and Saberian (2019), who find that an increase in day temperature reduces U.S. immigration judges' decisions that are favorable to the applicant. The second is by Kovacs (2017), who finds that, on unusually warm days, patent allowance rates are higher and final rejection rates are lower than on cold days at the

United States Patent and Trademark Office (USPTO). My findings are similar in flavor to Kovacs in that professional decision makers tend to make more lenient decisions during warmer periods—even though they work mostly indoors.

My paper also contributes to the broad literature that studies the role of institutional investors in the governance and policies of firms (e.g., Aghion, Van Reenen, and Zingales, 2013; Brav et al., 2008). My findings contribute to the literature focusing on the determinants of mutual fund voting (e.g., Fich, Harford, and Tran, 2015; Iliev and Lowry, 2015; Iliev, Kalodimos, and Lowry, 2021). I document that outdoor conditions have potentially significant implications for funds' voting decisions. Moreover, my study is related to the recent paper by Di Giuli, Garel, Michaely, and Petit-Romec (2022). Yet, there are two notable differences: while (1) they explore whether institutional investors' prior experience of abnormally higher temperatures impacts their voting and (2) focus on environmental issues, I look at general voting behavior *during* hot weather.

Finally, my paper contributes to the emerging literature on the financial implications of climate risk. Environmental risks have links to financial policies of firms (e.g., Dessaint and Matray, 2017), their cost of capital (e.g., Sharfman and Fernando, 2008; Delis et al., 2021) and debt financing (Goldsmith-Pinkham et al., 2021), as well as operating performance (e.g., Barrot and Sauvagnat, 2016). I contribute to this body of work by showing that institutional investors' engagement depends on climate conditions, which could have implications for firm outcomes (e.g., Hartzell and Starks, 2003; Dimson, Karakaş, and Li, 2015). The bottom line is that extreme heat is expected to be stronger over time and this implies the increasing importance of understanding potential implications of such climate risk for many other financial decision makers.

1.2 Stress, Temperature, and Proxy Voting

There are at least two channels laid out in economics and psychology literatures, which predict that hot weather might cause investors to be more inclined to support managers—risk aversion and mental resource depletion. I describe each mechanism in the following subsections. They provide differing predictions, however, on how that shift in support for managers would vary across matters of different importance.

1.2.1 Stress and Risk Preferences

An extensive literature in economics considers individuals' attitudes towards risk. Individuals are heterogeneous in risk preferences, with most of them being risk-averse (see, e.g., Dohmen et al., 2011). The traditional microeconomic theory view (e.g., Stigler and Becker, 1977) often posits that the intensity of an individual's risk attitude (i.e., risk aversion) is constant over time. In recent years, however, economists have started investigating the stability of risk preferences and the evidence that risk aversion may shift has been growing rapidly (see the review of Schildberg-Hörisch (2018)).[2] Among others, risk preferences have been linked to changes in emotions and stress (e.g., Loewenstein et al., 2001; Lerner and Keltner, 2001; Kuhnen and Knutson 2005, 2011).

Psychologists have been debating the theoretical connection between risk aversion and emotions. One hypothesis (see Isen and Patrick (1983)) suggests that positive feelings induce greater risk aversion, while negative feelings lead to a higher willingness to take risks. The intuition is that people who are feeling good are protective of their good mood states, while people

[2] For example, age (e.g., Paulsen, Platt, Huettel, and Brannon, 2011), beliefs (e.g., Malmendier and Nagel, 2011), education (e.g., Booth et al., 2014), and exogenous shocks such as natural disasters or violent conflicts (see for the review of Chuang and Schechter (2015)) affect risk preferences.

in bad mood take risks, trying to improve their mood. However, for example, the Affect Infusion Model (Forgas, 1995) predicts the opposite effects. If an individual is in good moods, they might evaluate the risk more positively and be willing to take it than an individual in bad moods.

Despite the conflicting theories, most empirical evidence supports the Affect Infusion Model—individuals are more risk-averse when they are in negative emotions like fear or stress. The evidence is found in both laboratory and natural experiment settings. In controlled laboratory settings, in which researchers directly measure subjects' risk aversion in various ways, many studies have found that stress causes a lower willingness to take risks (e.g., Kandasamy et al., 2014; Cohn, Englemann, Fehr, and Maréchal, 2015; Cahlíková and Cingl, 2017). Non-laboratory settings find similar evidence.[3] For example, evidence suggests that both investors and households' risk aversion increased during the 2008 financial crisis (Guiso, Sapienza, and Zingales, 2018; Necker and Ziegelmeyer, 2016). The findings are inconsistent with wealth or expected income channels and instead suggest an emotional channel.

I focus on heat stress and conjecture that this particular stress might decrease investors' risk-taking.[4] If investors become more risk-averse when the weather is hot, they may be inclined to vote in a more conservative way. I study a sample of shareholder-sponsored proposals, which typically urge a "reform" at the firm.[5] Often, shareholder proposals are ideas that management has previously not considered or did not view as important to its shareholders (e.g., Kanzer, 2017). As a result, management tends to push back most shareholder proposals submitted and recommends

[3] See also Edmans et al. (2007), which suggests that investors in a bad mood are less likely to take risks.
[4] The link between heat stress and risk aversion remains unclear as the evidence is mixed and findings are not largely consistent (e.g., Cao and Wei, 2005; Cheema and Patrick, 2012; Almås et al., 2020; Carias et al., 2022). A potential concern about the studies is that they tend to focus on subjects' acute (i.e., minutes to hours) exposure to heat instead of sustained (i.e., days to weeks) exposure to heat. The controlled laboratory experiment by Kandasamy et al. (2014) shows that only under a sustained elevation of cortisol (i.e., the primary stress hormone) does stress lead to greater risk aversion physiologically.
[5] Scott M. Stringer, the former New York City Comptroller, calls shareholder proposals "laboratories for reform." (See https://www.nytimes.com/2017/06/16/business/wells-fargo-clawback-fair-choice-act-shareholders.html.)

investors vote against them,[6] and investors are likely to view shareholder proposals as relatively "risky" ideas. In this case, I hypothesize that more risk-averse investors may be more likely to resist such an idea and instead support management. This suggests that investors under heat stress are positively correlated with voting with management. Furthermore, prior research shows that risk aversion rises with stake size (e.g., Fehr-Duda, Bruhin, Epper, and Schubert, 2010; Kachelmeier and Shehata, 1992; Binswanger, 1981). This evidence suggests that investors' risk aversion is toward proposals that they have higher stakes. Hence, the occurrence of heat should be more strongly correlated with these high-stake proposals.[7]

1.2.2 Temperature Stress and Resource Depletion

Psychologists have been documenting relationships between temperature stress and behavior for decades. In particular, heat stress induces various negative effects on individuals' emotions, moods, and performance.[8] For example, individuals tend to be more aggressive and violent (e.g., Anderson, 1989; Anderson et al., 2000) and perform less well (e.g., Hancock and Vasmatzidis, 2003; Graff Zivin, Hsiang, and Neidell, 2018) when they are exposed to high ambient temperatures. Moreover, heat stress depletes resources (e.g., Hancock, 1986; Hancock and Warm, 1989; Cheema and Patrick, 2012; Wang et al., 2019).

A substantial body of evidence supports that resource depletion has a systematic influence on behavior (see the review of Hagger, Wood, Stiff, and Chatzisarantis (2010)). A highly robust

[6] Management often argues that the reform is unnecessary or is inconsistent with the firm's culture.
[7] Assumes that an increase in risk aversion due to heat is proportional to the original risk aversion level.
[8] While exposure to cold can have similarly adverse consequences for physical functioning (e.g., Huynen et al., 2001), the human body has greater tolerance for cold than for heat so heat stress has a greater influence than cold stress (e.g., Wyndham, 1969). Consistent with this, most attention has focused on the consequences of high temperatures (see, e.g., the review of Heal and Park (2016)). In unreported analysis, I verify no significant association between cold exposure and an investor's tendency to vote against management.

effect is that individuals with depleted mental resources rely more on intuitive, effortless decision-making (e.g., Masicampo and Baumeister, 2008) and are more likely to increase the share of reference-dependent choices (see, e.g., Pocheptsova et al., 2009).

Relatedly, several studies have found that mental depletion increases people's tendency to simplify decisions by accepting the status quo. For example, mentally depleted judges are more likely to accept the default, status quo outcome (i.e., deny a prisoner's request) (Danziger, Levav, Avnaim-Pesso, 2011), and voters who are facing more decisions (Augenblick and Nicholson, 2016) or cast their votes on rainy days (Meier, Schmid, and Stutzer, 2019) have a significantly lower likelihood of opting for change.

An alternative to the risk-aversion channel described in Section 2.1 is a change in investors' mental resources under the hot weather. If heat stress drains mental resources, investors are more likely to rely on effortless, reference-dependent voting, e.g., showing a greater dependence on voting references such as management or proxy advisory firms' vote recommendations. In addition, as suggested above, people with depleted mental resources tend to stick to the status quo. This suggests that mentally depleted investors under the hot weather are more likely to prefer the status quo and simplify voting decisions by relying on management who is responsible for the company's status quo. While this prediction points in the same direction as the risk-aversion channel (i.e., a higher likelihood of voting with management), there is little reason to conjecture that—with a resource depletion account—hot weather should be more strongly correlated with high-stakes proposals. If anything, because when people are mentally depleted they might focus their attention on relatively more valuable tasks (e.g., Kurzban et al., 2013), these particularly important proposals should be less affected by the hot weather, contrary to the risk-aversion hypothesis.

1.3 Data

I obtain mutual funds' voting data from Institutional Shareholder Services (ISS). I begin with all voting records from the ISS Voting Analytics database, of a total of 787 institutions, for the entire sample period from 2003 to 2020. I restrict the sample to institutions that are US based, and the resulting sample includes 739 institutions.

I use the voting data to measure institutions' engagement with portfolio companies following the literature (e.g., Iliev and Lowry, 2015; Gilje, Gormley, and Levit, 2020; Iliev, Kalodimos, and Lowry, 2021). Prior research suggests institutional investors use various shareholder measures to engage with management and take a monitoring role. I focus on voting against management, which is second most used measure—next to discussions with top management—by large institutional investors (McCahery, Sautner, and Starks, 2016).[9] $Voting\ against\ management_{f,i,p,t}$ is the percentage of fund family f's votes that differed from management's recommendation on proposal p of firm i in year t.

I collect zip code information of approximately 600 institutions from the CRSP Mutual Funds database. For the remaining institutions, I hand-collected the information from various online sources including SEC registrations, Bloomberg Company Profile, or the company website. For the most institutions, the zip code is based on their corporate headquarters.[10] As can be seen in Figure 1, 739 institutions in my sample are spread across most states in the United States.

[9] See, also, Iliev, Lins, Miller, and Roth (2015) for the effectiveness of shareholder voting to exercise governance.

[10] Most mutual fund families aggregate all of their funds' votes and cast them by their investment stewardship team (see, e.g., Griffith and Lund, 2019). Some institutions, such as Voya Financial, have their stewardship team located in other place than their headquarters, and in these cases, I use those places' zip code information instead. For simplicity, I assign only one zip code to each institution for the institution's sample period in the dataset. While some institutions moved during their sample period, in most cases, they moved to near areas which have similar climate history.

To measure whether an institution votes during hot weather, I use daily temperature data from the National Oceanic and Atmospheric Administration (NOAA). For each fund family's zip code, I identify the closest weather station whose daily temperature data for the sample period are available in the database. The primary variable I use is daily average temperature. In cases in which stations provide only daily maximum and minimum temperatures, I compute daily average temperatures by averaging those two temperatures.

The key explanatory variable for my analysis is a dummy variable $Hot_{f,i,p,t}$ that equals one if fund family f's voting window on proposal p of firm i belongs to the investor location's hottest (consecutive) 30-day window of year t—based on 30-day moving averages of daily average temperatures—and zero otherwise. I do not directly observe the date and time at which investors cast votes in the voting database, but I can plausibly approximate an interval of time during which the investors research and cast votes (i.e., voting window). I define the voting window to be a 2-week period prior to an annual shareholder meeting date. [11]

Data on mutual fund ownership come from the CRSP Mutual Fund database. In tests I use the ownership data, I confine my analysis to between 2008 and 2020 due to errors in the CRSP mutual fund file prior to this (Schwarz and Potter, 2016).

Table 1 provides summary statistics for heat and my outcome variables of interest. For the average shareholder proposals in my sample, the likelihood of institutional investors voting for the

[11] Specifically, the voting window is defined as [-3 weeks, -1 week] prior to a meeting date in busy proxy season (i.e., from the fourth week of April to the end of May, following Calluzzo and Kedia (2022)) and [-4 weeks, -2 weeks] prior to a meeting date in other times. Most shareholder voting takes place electronically in the weeks before the meeting (see Li and Yermack, 2016). Also, ISS, the world's largest proxy advisor, releases vote recommendations, which most large fund families refer to, 13 - 20 days (in the proxy season) or 13 – 30 days (in normal times) before annual meeting date (https://www.issgovernance.com/file/policy/active/americas/US-Procedures-and-Policies-FAQ.pdf). My basic premise is that investors start conducting independent research as to how to vote around the issuance of the recommendations. My intent in using a relatively wide window is to ensure that I capture various possible events that may affect the voting decision – information diffusion among investors via trading and word-of-mouth, or the arrival of a public news story.

proposal is 44.4%. Institutions are more likely to make a voting decision that is consistent with management recommendation (48.9%) than not (35.6%); management does not provide their recommendation for the remaining 15.5% of the total number of observations in the analysis. Regarding ISS recommendations, institutional investors cast votes that are consistent with the proxy advisor's recommendation in 74.9% of observations. Only in rare cases, institutions choose not to follow either of vote recommendation from management or ISS, which occurs in 5.1% of cases. On average, voting in hot weather accounted for about 1% of observations, which is of similar magnitude for voting in cold weather.

1.4 Estimation Strategy

To analyze the association between an institution's voting behavior and exposure to high temperatures, I estimate equations of the form

$$Voting\ against\ management_{f,i,p,t} = \beta\ Hot_{f,i,p,t} + \gamma_{f,t} + \delta_p + \varepsilon_{f,i,p,t},$$

where $Voting\ against\ management_{f,i,p,t}$ is the percentage of fund family *f*'s funds that voted against management's recommendation on proposal p for firm i in year *t* and *Hot* is a dummy variable that takes on the value one if fund family *f* votes on proposal *p* of firm *i* during the hottest 30-day period of the year *t* and zero for voting in other times of the year. I cluster standard errors at the institution level because the residuals might be correlated serially and within institutions.

Fund family and proposal context can be expected to impact voting decisions (e.g., Brav, Jiang, Li, and Pinnington, 2021). I include institution-by-year fixed effects, $\gamma_{f,t}$, which allows for systematic differences in voting decisions between institutions in different years. Importantly, I also include proposal fixed effects, δ_p, which help us control for average differences in the voting outcomes of different proposals. Thus, the main coefficient β is estimated by comparing across proposals within a given institution in a given year and across institutions within a given proposal.

Primarily, I am identifying off within-proposal variation. My identifying assumption is that once proposal fixed effects are controlled for, the realization of the proposal's 2-week voting window being within any *particular* fund family's hottest 1-month period of the year is as good as random. That is to say, I can examine a proposal for Microsoft that will be voted in June. For some fund families, the voting window of the proposal may be assigned the hottest-30-day-period-of-the-year treatment, but for others it may not be. It is that variation that I exploit for identification.

1.5 Results

1.5.1 Baseline Results

I find that investors are less likely to vote against management in hotter temperatures. Table 2 shows regressions of an indicator for voting against management on the measure of hot weather described in Section 3, using the entire sample and various subsamples of shareholder proposals. Column 1 shows an estimate of the equation in Section 4 for the whole sample (i.e., all shareholder proposals). I find that extreme heat is strongly correlated with a lower likelihood of voting against management ($p < 0.001$). The economic magnitude is sizable: Heat exposure is associated with a 2.6 percentage point decrease in the likelihood of voting against management, which is a 7.3% decrease relative to the sample mean (0.36).

Table 2 shows that heat appears to have similar associations across different subsamples of shareholder proposals and the magnitude does not vary substantially. Recent studies provide evidence that the level of institutions' engagement seems to depend on the types of proposals because of limited resources. Not surprisingly, institutions would pay more attention to agendas in which key players (e.g., managers and proxy advisors) have conflicts in terms of vote recommendation. Following Iliev and Lowry (2015), I define contentious proposals as issues where ISS recommends against management. I also focus on a sample of closely contested proposals, defined as those whose outcome was within plus minus 5 percentage points from passing threshold (He, Huang, and Zhao, 2019). Higher uncertainty about the vote outcome makes an institution's action (e.g., monitoring the firm) more valuable. As Column (2) and (4) of Table 2 show, I find that a large heat-voting relationship persists even for those issues that are generally drawing higher level of attention from institutions.

The findings are surprising to the extent that an investor's additional attention does not seem to help mitigate the association with heat. Note that the results need not mean that investors do not prioritize when they monitor firms (and evaluate proposals). It is likely that while investors may intend to focus more on certain issues that are worthwhile doing so, heat might unconsciously be related to the investors more broadly. Thus, these results indicate that unless individuals are *aware* of such association, extra attention itself might not be beneficial in avoiding it.

1.5.2 Reliance on Proxy Advisor

My estimates imply that heat can potentially affect institutions' voting decisions, making them tilt toward management. The findings are consistent with the mental resource depletion channel, as described in Section 2. One could argue that reductions in investors' mental resources can mean reductions in their "attention"—toward portfolio firms. Several papers measure investors' attention as the extent to which they vote against ISS recommendations (e.g., Iliev and Lowry, 2015; Gilje, Gormley, and Levit, 2020). The underlying premise is that more attentive investors who might conduct more independent research are less likely to follow proxy advisor's recommendation, on average. Thus, the reduction in attention due to high temperatures predicts greater reliance on proxy advisory firm's vote recommendation.

I estimate changes in institutions' reliance on proxy advisor under heat stress by regressing the percentage of a fund family's funds that votes against ISS recommendation on the same set of independent variables in the equation in Section 4. Panel A of Table 3 reports the association between the attention measure (i.e., voting against ISS) and the high-temperature measure, *Hot*. As Panel A shows, for all shareholder proposals (i.e., the whole sample), investors do not appear to exhibit any change in their voting behavior with respect to ISS recommendations. However, Panel A hides an important fact. To take a closer look, I can split shareholder proposals into ones with and ones without management recommendation, which account for about 55% and 45% respectively.[12]

To begin, Panel B looks at proposals with management recommendation. Columns 1 and 2 of Panel B show regressions of the percentage of a fund family's funds that votes against management and ISS, respectively, on the main *Hot* variable and the large number of fund-family-by-year and proposal fixed effects. The results are similar to the findings for all shareholder proposals: institutions seem to have a clear tendency to be more likely to follow management under heat stress, while reliance on ISS does not appear to change.

Some insights can be gained from examining their voting behavior more closely. Columns 3 through 6 present the regression results of how an institution votes regarding both management and ISS recommendations simultaneously on the same proposals. The results suggest that investors seem to be more likely to become lenient toward management in higher temperatures, independent of how they vote as to what ISS recommends. However, if I look at proposals in which only ISS

[12] In contrast, ISS provides its vote recommendation for nearly all proposals.

recommendation is available, heat is positively associated with institutions' reliance on the proxy advisor, as can be seen in Panel C (p = 0.052). In other words, institutions are likely to be less attentive when they are experiencing hotter temperatures. The economic magnitude is substantial; institutions are roughly 40 percent less likely to vote against ISS during the hottest 30-day period of a given year than other times of the year.

An interesting interpretation of the findings is that institutions might have a varying degree of credibility about vote recommendations from management and proxy advisory firms: when both recommendations are available, institutions seem to increase their reliance on only management, rather than proxy advisors such as ISS when needed. These findings are in line with observations in the survey that while institutions as equity holders often actively engage with management via various channels (e.g., behind-the-scenes discussions), the use of proxy advisor can be limited given the investors' concerns about potential conflicts of interest in proxy advisors (see McCahery, Sautner, and Starks, 2016). However, when advice from proxy advisory firms is the only guidance available, investors seem fairly dependent on them.

1.5.3 Robustness

While the assignment of a hottest 30-day period to a particular zip code in a given year is random, a potential concern with my identification strategy is that a hottest 30-day window can be correlated with, for example, a calendar month. If this is true, some of my findings so far are being driven by calendar month effects. For example, a fund family might have certain events—scheduled in the same month every year—that can affect their voting behavior. Then, it would be difficult to distinguish any effects of the heat exposure from these firm events' effects.

To mitigate this concern, I run regressions using the main specification in Section 4, but with fund-family-by-month fixed effects instead. Panel A of Table 4 reports the regression results. I find that the negative association between heat and voting against management remains stable. Thus, the results possibly rule out calendar month effects as the regressions compare proposals voted during the time that belongs to the hottest 30-day window of the year (e.g., late July) to ones voted other time (e.g., early July), both within the *same* month. As Columns 2 and 3 show, the results hold on contentious shareholder proposals as well as contested proposals, consistent with the baseline results in Section 5.1 with fund-family-by-year fixed effects.

As further robustness checks, I also perform placebo exercises. In the main specification, I add two indicator variables, which represent voting during the 30-day period prior to the original hottest 30-day window, and voting during the 30-day period following the hottest 30-day window, respectively.[13] As reported in Panel B of Table 4, I find no statistically significant result in each of these two periods—for both entire sample (i.e., all shareholder proposals) and the subsample consisting of contentious shareholder proposals.

One could argue that since these periods would have relatively milder weather in terms of temperature, by definition, we might expect slightly weaker correlations between the milder heat and voting against management. However, in each case the absolute value of the estimate of the coefficient of interest is a few times smaller, signs are mixed, and in no case is statistical significance achieved. In fact, this finding is consistent with recent evidence that productivity

[13] It is important to note that using relative temperature measures—as I construct the key independent variable *Hot*—has some merit (e.g., Masiero et al., 2022; Heutel et al., 2021). For example, relative measures account for regional heterogeneity: since people adapt to their local environment, say, 100°F may not feel the same to people in Florida as in Minnesota. Therefore, absolute temperatures might underestimate the adverse effects of hot temperatures for people in warmer areas.

measures such as labor performance decline abruptly beyond temperature thresholds, indicating heat intensity matters (e.g., Hsiang, 2010; Burke, Hsiang, and Miguel, 2015a).

1.6 Heterogeneity

Thus far, I have shown evidence that heat is strongly significantly correlated with voting. Previous analysis also showed that institutional investors exhibit this heat-voice relationship even for typically more important voting (i.e., voting on contentious or contested issues), but a limitation is that it does not account for variation across institutions. In this section, I explore the importance of proposals to each institution and study how this relationship differs across proposals of varying importance. I then turn to institutions' geographic locations to get a better understanding of how adaptation matters for voting behavior.

1.6.1 Do Larger Holdings Help?

There is evidence indicating that institutional monitoring is positively associated with a portfolio firm's weight in the institution's portfolio (e.g., Fich, Harford, and Tran, 2015; Iliev, Kalodimos, and Lowry, 2021). Institutions may pay more attention to larger positions because they have stronger voting power, or simply because of financial incentives.[14] Following the literature, I proxy for the importance of a stock (and its proposals) to an institution by calculating the fraction of the institution's overall portfolio represented by the stock.

As described in Section 2, predictions on how hot weather could influence voting on high-stake proposals are conflicting. The changes-in-risk-preference channel suggests that if high

[14] Lewellen and Lewellen (2022b) show financial incentives motivate institutions to be engaged shareholders.

temperatures induce an increase in an investor's risk aversion, the occurrence of heat should be more strongly correlated with higher-ownership proposals because the investor's risk aversion is concentrated among those more important proposals. However, the mental resource depletion channel predicts the opposite: If heat drains mental resources, the heat-voice association will be weaker where institutions are known to pay more attention (i.e., larger positions).

I begin by constructing an expanded dataset that includes mutual fund holdings data from the CRSP Mutual Fund Database. I manually match the voting data to the CRSP Mutual Fund Database using institution names. The beginning year of the sample period has also changed from 2003 to 2008 because of errors in the Database prior to this (Schwarz and Potter, 2016).

The results in Panel A of Table 5 support the risk preference mechanism. I find that the higher reliance on management under hot weather seems stronger on proposals with larger holdings. To ease interpretation, *Holdings* is scaled by its sample standard deviation. The magnitude is perhaps more important to consider. For stocks that an institution holds more by one standard deviation, the negative correlation between higher temperatures and voting against management is 135% stronger. This suggests that larger positions seem to exacerbate the higher leniency toward management in higher temperatures.

Our estimates here provide an important consideration that institutional investors might be most vulnerable on matters that are most important to them. While some results seem to be driven by investors' cognitive depletion in higher temperatures as described in Section 5.2, overall findings suggest that increased risk aversion is a potential mechanism underlying voting decisions. This is also consistent with the evidence in Section 5.1 that institutional investors exhibit large correlations (if not larger) for proposals that would generally be thought more important.

1.6.2 Unusually Hot Weather

The analysis above focuses on the hottest window each year. An alternative is to compare temperatures across years at the institution level. The underlying goal is to understand how an institution responds to particularly hotter temperatures during its sample period. It is well known that climate change is raising global temperatures. For example, the 2017 U.S. Climate Science Special Report predicts that by the end of this century, temperatures will be at least 5 degrees Fahrenheit warmer than the 1901-1960 average. In addition, perhaps more importantly, scientists find clear relationships between climate change and severe weather events: a dangerous heat wave that in the past would have occurred just once in each region every 50 years can today be expected every 10 years, and nearly annually in the future (IPCC, 2021). Thus, if institutions exhibit more vulnerability to such extreme heat events, the scientific evidence could suggest greater concerns about the potential impact of temperature on voting in coming decades.

To get at this issue, I first calculate the mean temperature of hottest 30-day periods across years during the sample period for a given institution. I then measure the difference between the mean temperature of the hottest period each year and the calculated mean temperature for the institution, implying how hotter-than-normal each year is in degrees Fahrenheit. To increase power in this analysis, I focus on proposals for contentious issues for which investors' monitoring may be more important.

Results reported in Panel B of Table 5 suggest that investors' tendency to be more likely to follow management in higher temperatures seems to be significantly stronger when they experience an unusually hotter 30-day period. The magnitude is economically significant: when investors vote during their hottest period that is 1.7 degrees Fahrenheit (one standard deviation) higher than the average hot temperature during the period, the negative association between heat and voting against management is about 42% (= 1.7*0.00737/0.0297*100) stronger. Thus, the results suggest that the heat-voting relationship I document above might understate the potential impact of high temperatures on voting when climate change is likely to increase the frequency and intensity of extreme heat events.

1.6.3 Adaptation

As climate change is becoming one of the major challenges of our time, scholars are paying increasing attention to adaptation to heat. One way that individuals adapt to heat is through acclimatization which is the physiological adaptations that occur during repeated exposure to a hot environment.

Figure 2 illustrates annual state temperature averages based on historical daily temperatures of the 30-year period from 1971 to 2000. Within this classification, each state is assigned to one of eight regions with similar average temperatures.[15] The coldest state Alaska has average daily temperature of below 30 degrees Fahrenheit, while the hottest state Florida has the highest average temperature of over 70 degrees Fahrenheit providing a contrasting image of temperature variations across states in the U.S. Because individuals in warmer regions including Texas and Georgia are exposed to hotter tropical climates compared to ones in upper regions such as New York, investors in those warmer areas should have relatively more acclimatization to heat.

As Table 6 confirms, I do *not* find a statistically significant relationship between heat and voting in the southern part of the U.S. such as Texas, Georgia, or Florida. I also find that the baseline results for average investors described in Section 5.1 hold for investors that are in most of other areas (e.g., New York, Illinois, and California). The estimates overall suggest that the

[15] Other climate zone classifications, based on seasonal precipitation or temperature patterns, exist.

heat-voting relationships are generally weak in the regions with higher average temperatures (in which adaptation to heat might be greater). The role of adaptation to heat in warmer regions is consistent with Barreca et al.'s (2016) finding that the impact of extreme heat on mortality is notably smaller in states that more frequently experience extreme heat.[16]

1.7 Conclusion

The growing concerns about climate change raise fundamental questions about its role in corporate governance. Prior studies typically focus on institutional investors' shifting preferences toward ESG issues at firms. This paper examines the relationship between higher temperatures and monitoring *actions* of institutional investors focusing on their proxy voting. Psychological and economic evidence provide predictions that hot weather is associated with mental depletion and increased risk aversion.

I find that heat is significantly negatively correlated with voting against management, which can be interpreted as weakened monitoring toward management under the heat. My results also suggest that institutional investors that experience higher temperatures are more likely to vote with the proxy advisory firm ISS's recommendation—on proposals in which only the ISS recommendation is available—indicating reduced attention to firms. An institution's increased likelihood of reduced voice is especially greater when they hold a larger stake in the firm. This result suggests that the heat-voice association is likely due to changes in risk aversion, and investors' high-stake matters may be more susceptible to extreme climate.

[16] See, also, Medina-Ramón and Schwartz (2007), Dell, Jones, and Olken (2009), Graff Zivin, Hsiang, and Neidell (2018), Heutel, Miller, and Molitor (2021), and Pankratz and Schiller (2022) for consistent evidence that adaptation actually offsets negative effects of climate.

One of the most interesting findings is that the leniency toward management in the heat seems more substantial when institutions experience unexpectedly hotter temperatures. Climate change has a potential to exacerbate management monitoring in the future. Changes in climate trends that bring previously unlikely, but hotter weather events can be of a real threat not only to outdoor workers, but professional institutional investors. I find, however, that the heat-voting association is weaker in warmer regions, suggesting a potentially important role of adaptation.

My results have several implications. The most immediate is that institutional investors can benefit from becoming aware of the existence of such possible deviations in their judgments and actions. While I only examine one governance mechanism which induces managers' corrective behaviors through voting, there are many other known behind-the-scenes shareholder engagement measures such as discussions with top management or aggressively questioning management on a conference call. Thus, extreme heat can potentially weaken these other monitoring activities and eventually hurt firm performance, which I believe would be interesting to further research.

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Table 1

Summary Statistics

This table presents summary statistics for our dependent variables and explanatory variables of interest. Variables include institutional investors' voting patterns regarding management and ISS vote recommendations, voting during the hottest time of the year, and excess hot temperature. The hottest period is based on 30-day moving averages of daily average temperatures in a given year for a given institution. The sample period is from 2003 to 2020.

	N	**Mean**	**SD**	**Min**	**Max**
Investor voting indicators					
Votes "For"	1,155,413	0.444	0.483	0	1
Votes against management	1,155,413	0.356	0.464	0	1
Votes against ISS	1,155,413	0.251	0.416	0	1
Votes with management	1,155,413	0.488	0.486	0	1
Votes with ISS	1,155,413	0.749	0.416	0	1
Votes against mgmt. & against ISS	1,155,413	0.051	0.212	0	1
Votes against mgmt. & with ISS	1,155,413	0.305	0.448	0	1
Votes with mgmt. & against ISS	1,155,413	0.177	0.366	0	1
Votes with mgmt. & with ISS	1,155,413	0.311	0.460	0	1
Weather					
Indicator for voting during hottest period	1,155,413	0.008	0.087	0	1
Indicator for voting during 30-day period prior to hottest period	1,155,413	0.030	0.170	0	1
Indicator for voting during 30-day period following hottest period	1,155,413	0.009	0.096	0	1
Excess heat	1,155,413	-0.002	1.663	-3.523	4.115

Table 2

Voice and Extreme Heat

This table examines the association between hot temperature and voting against management (i.e., voice), estimating a regression of voting against management on the hottest time of the year. The dependent variable, *Voting against management*, is the percentage of a fund family's votes that differed from firm management's recommendation on a given proposal. *Hot* indicates voting during the hottest 30-day window in a given year for a given fund family. I further include fund family-by-year and proposal fixed effects. Each column represents samples of shareholder proposals. Statistical significance is based on robust standard errors, as reported in parentheses. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

Sample	All Shareholder Proposals (1)	Contentious Proposals (2)	Non-contentious Proposals (3)	Contested Proposals (4)	Non-contested Proposals (5)
Dependent variable =			*Voting against management*		
Hot	-0.0261***	-0.0279***	-0.0170*	-0.0446**	-0.0253***
	(0.00718)	(0.00941)	(0.00989)	(0.01836)	(0.00746)
Fund family-year fixed effects	Yes	Yes	Yes	Yes	Yes
Proposal fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	1,155,413	576,415	578,998	66,951	1,088,462

Table 3

Proxy Advisor and Heat

This table analyzes the association between hot temperature and voting patterns—especially regarding ISS recommendation. Panel A provides results of a regression of voting against ISS recommendation on the hot weather. The dependent variable, *Voting against ISS*, is the percentage of an institution's votes that differed from ISS's recommendation on a given proposal. *Hot* indicates voting during the hottest 30-day window in a given year for a given institution. Panel B reports estimates from regressions of various voting behaviors onto the main *Hot* independent variable for proposals with both management and ISS recommendations. For example, *Voting with management & against ISS* is the percentage of an institution's votes that followed management but differed from ISS's recommendation on a given proposal. Panel C reports results of estimating a regression of voting against ISS on hotter temperatures for proposals with only ISS recommendation. Standard errors, clustered at the institution level, are reported in parentheses. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

Panel A: Proxy Advisor and Heat for All Shareholder Proposals

Dependent variable =	*Voting against ISS*
Hot	-0.00342 (0.00928)
Fund family-year fixed effects	Yes
Proposal fixed effects	Yes
Observations	1,155,413

Panel B: Voting Patterns for Proposals with Management and ISS recommendations

Dependent var. =	*Voting against management*	*Voting against ISS*	*Voting with management & against ISS*	*Voting with management & with ISS*	*Voting against management & with ISS*	*Voting against management & against ISS*
Hot	-0.0299*** (0.00783)	0.00613 (0.00881)	0.0197*** (0.00621)	0.0102** (0.00447)	-0.0164** (0.00757)	-0.0136* (0.00706)
Fund family-year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Proposal FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	975,180	975,180	975,180	975,180	975,180	975,180

Panel C: Proxy Advisor and Heat for Proposals with only ISS recommendation

Dependent variable =	*Voting against ISS*
Hot	-0.0617* (0.0317)
Fund family-year fixed effects	Yes
Proposal fixed effects	Yes
Observations	180,233

Table 4

Robustness Tests

This table reports results regressions of voting against management on heat using a different set of fixed effects and a regression that relates other times of the year, in addition to the original hottest 30-day window, to voting against management. Panel A provides estimates of regressions of voting against management on voting during the hottest 30-day period of the year using fund family-by-month fixed effects for various samples, including contentious or contested proposals. Panel B provides results of regressions of voting against management on voting during two additional periods other than the original hottest 30-day period of the year. Each additional indicator equals one if an institutional investor votes during 30-day window prior to or following the hottest 30-day window of the year, and zero otherwise. Standard errors, clustered at the institution level, are reported in parentheses. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

Panel A: Robustness to Using Different Fixed Effects

Sample	All Shareholder Proposals (1)	Contentious Proposals (2)	Contested Proposals (3)
Dependent variable =		*Voting against management*	
Hot	-0.0159** (0.00799)	-0.0195* (0.0104)	-0.0702*** (0.0214)
Fund family-month fixed effects	Yes	Yes	Yes
Proposal fixed effects	Yes	Yes	Yes
Observations	1,155,413	576,415	66,951

Panel B: The Association between Heat and Voting against Management in Other Times of the Year

Dependent variable =	*Voting against management*
$Indicator\ for\ voting\ during\ 30-day\ window\ prior\ to\ the\ hottest\ 30-day\ window$	0.00816 (0.00708)
Hot	-0.0254*** (0.00718)
$Indicator\ for\ voting\ during\ 30-day\ window\ following\ the\ hottest\ 30-day\ window$	-0.00235 (0.00761)
Fund family-year fixed effects	Yes
Proposal fixed effects	Yes
Observations	1,155,413

Table 5

Heterogeneity Tests: Larger Holdings and Excessive Heat

This table examines whether the heat-voice relationship varies based on an institution's holdings in the portfolio firm and the experience of excessively hotter temperatures during the hottest 30-day of the year. Panel A reports coefficients from a regression of voting against management onto *Hot* and the interaction term *Hot* × *Holdings*, fund family-year fixed effects and proposal fixed effects. *Holdings* equals the fraction of an institution's overall portfolio represented by a stock. *Holdings* is included but unreported for simplicity. The sample period of this analysis is 2008-2020 due to errors in holdings data prior to this. Panel B reports results of a regression of voting against management onto *Hot* and the interaction term *Hot* × *Excess Heat*, and the same sets of fixed effects. *Excess Heat* represents how hotter-than-normal each year is in degrees Fahrenheit (see Section 6.2 for details.). Standard errors, clustered at the institution level, are reported in parentheses. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively.

Panel A: Do Larger Holdings Help?

Dependent variable =	*Voting against management*
Hot	-0.0200** (0.00919)
$Hot \times Holdings$	-0.0269** (0.0108)
Fund family-year fixed effects	Yes
Proposal fixed effects	Yes
Observations	712,245

Panel B: Unusually Hot Weather

Sample	Contentious Proposals
Dependent variable =	*Voting against management*
Hot	-0.0297*** (0.00951)
$Hot \times Excess\ Heat$	-0.00737* (0.00432)
Fund family-year fixed effects	Yes
Proposal fixed effects	Yes
Observations	576,415

Table 6

Adaptation via Acclimatization

This table reports results on whether the association between higher temperatures and voting against management varies based on an institution's geographic location. Using historical daily average temperatures of the 30-year period (1971-2000) from the National Oceanic and Atmospheric Administration (NOAA), I classify U.S. states into eight groups based on annual state temperature averages (See Figure 2). Groups for average temperatures of 25-30 (i.e., Alaska) and 65-70 (i.e., Louisiana) and excluded because there is no institution available in the data. Examples of states in each sample (i.e., group) can be found on the second row of the table. I include fund family-by-year and proposal fixed effects. Standard errors, clustered at the institution level, are reported in parentheses. * and ** indicate significance at the 0.10 and 0.05 levels, respectively.

Sample's Avg. Temp. (°F)	40-45	45-50	50-55	55-60	60-65	70-75
Ex.	WI, MN	NY, PA	NJ, IL	CA, NC	TX, GA	FL, HI
Dependent variable =			*Voting against management*			
Hot	-0.0399 (0.0328)	-0.0265* (0.0151)	-0.0302* (0.0175)	-0.0452** (0.0228)	-0.0261 (0.0297)	0.00194 (0.0489)
Fund family-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Proposal fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	64,939	600,020	242,713	125,744	106,453	15,465

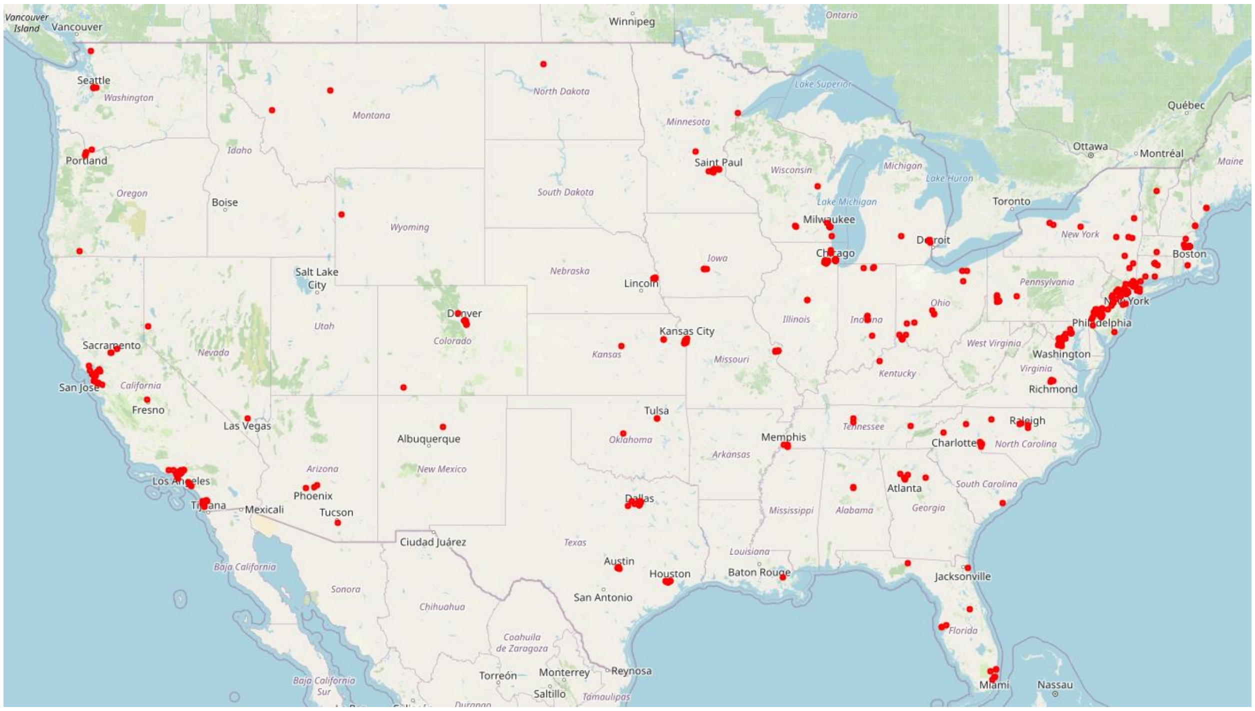

Figure 1 Location of Fund Families

This figure plots U.S. mutual fund families' location based on their headquarters in which I assume proxy voting decisions are made.

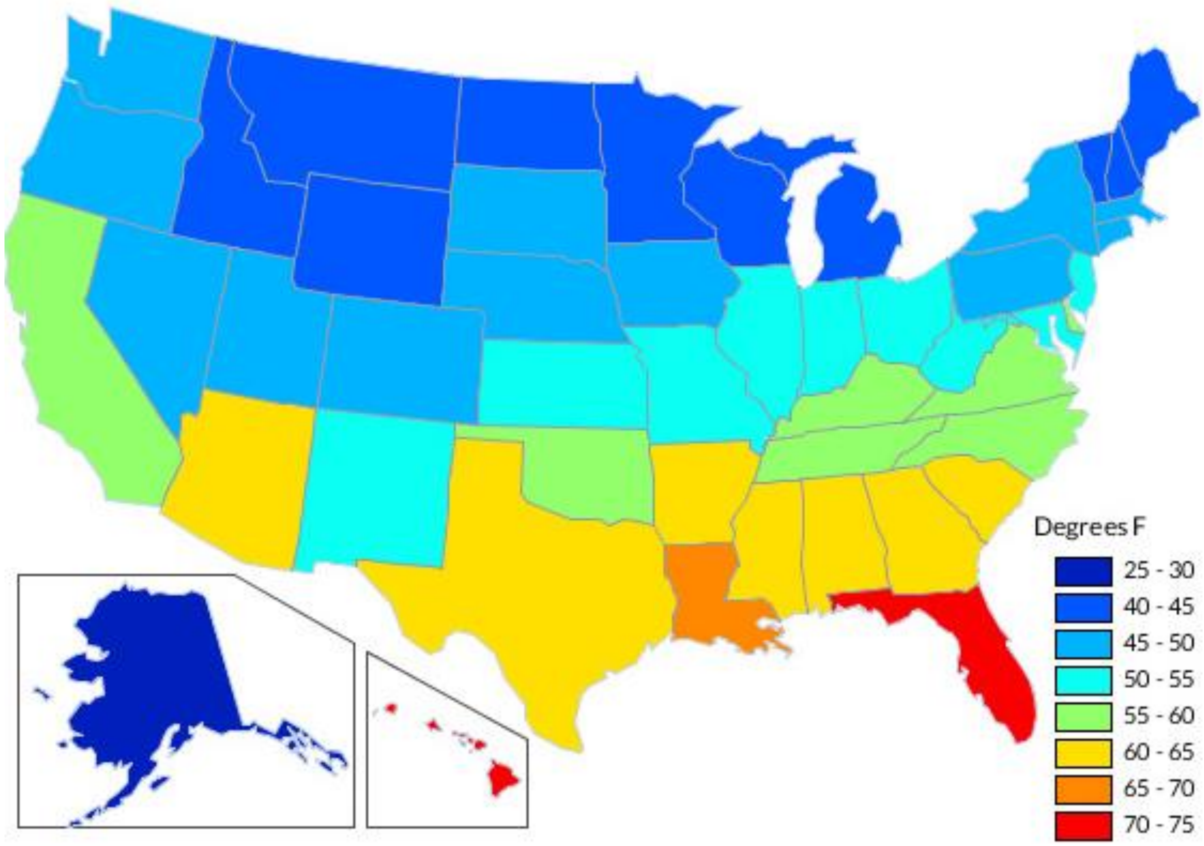

Figure 2 Annual State Temperature Averages Based on the NOAA, 1971-2000

This figure illustrates eight groups of U.S. states that are categorized based on annual state temperature averages using historical daily average temperatures of the 30-year period from 1971 to 2000.

Chapter 2: Is the Tail Wagging the Dog? Active Holdings and Passive Investors' Attention[1]

2.1 Introduction

Institutional investors that primarily offer passively managed funds hold an ever-greater fraction of U.S. public equity. "The Big Three" institutions that account for 75% of all U.S. indexed funds—BlackRock, State Street, and Vanguard—quadrupled their average combined ownership of Standard & Poors (S&P) 500 companies over twenty years, from 5.2% in 1998 to 20.5% in 2017 (Bebchuk and Hirst, 2019a). Moreover, evidence suggests that these increasingly large institutions exert considerable governance influence over companies via their "voice" and ability to vote (e.g., Appel et al., 2016; Azar et al., 2021; Gormley et al., 2023). However, the motive for these institutions' engagement as stewards is unclear (e.g., Bebchuk and Hirst, 2019b). For example, if passive funds primarily compete on delivering the returns of a market index (e.g., S&P 500) with minimum expenses and tracking error, why would they (or the institutions that offer them) expend resources seeking to influence companies' governance choices?

A possible answer lies in the fact that many "passive" owners of a firm are also "active" owners of the same firm via their actively managed funds. For example, industry estimates suggest that nearly 30% of The Big Three's assets under management (AUM) in June 2017 was held in actively managed funds.[2] And in 2019, Vanguard's actively managed AUM was almost the same size of Fidelity Investments' active AUM, making Vanguard one of the largest active investors in

[1] This essay is a joint work with Ian Appel, Todd Gormley, Donald Keim, and Chaehee Shin. The views expressed here are strictly those of the authors and do not represent the views of the Federal Reserve Board or the Federal Reserve System.

[2] Specifically, the proportion of assets in active funds was 34% for BlackRock, 26% for Vanguard, and 21% for State Street in June 2017, surveyed by Morningstar. See Morningstar (2017), which can be found at https://www.morningstar.com/funds/passive-fund-providers-take-an-active-approach-investment-stewardship.

the U.S.[3] In this paper, we explore whether passive fund families' actively managed holdings might affect their incentive to be engaged stewards. More specifically, we analyze whether fund families' active ownership stakes predict the level of attention they pay to individual stocks.

A priori, it is not obvious that having an active ownership position would affect monitoring by the larger fund family. For many large mutual fund families, including The Big Three, stewardship decisions—how to monitor, vote, and engage with portfolio companies—are made by a dedicated, centralized stewardship team operating at the fund family level (e.g., Griffith and Lund, 2019). Such teams may base their monitoring decisions on other criteria, including the fund family's overall investment in the stock (e.g., Iliev and Lowry, 2015; Iliev, Kalodimos, and Lowry, 2021), rather than whether part of the fund family's position is held in actively managed portfolios. Moreover, because the stewardship resources devoted to each stock are relatively smaller for such institutions (Bebchuk and Hirst, 2019b), these stewardship teams might lack the expertise required for successful, stock-specific interventions (e.g., Schmidt and Fahlenbrach, 2017). In this case, actively managed funds within these larger fund families may choose to exit positions rather than engage in alternative forms of governance (Kahn and Winton, 1998).

However, there are reasons why an active ownership position might affect monitoring. First, active fund managers have stronger incentives to collect private information (as their objective is to trade profitably on such information), and they might have more time to monitor each stock as they tend to hold more concentrated positions than their passively managed counterparts. If centralized stewardship teams incorporate the views of active managers, active funds' monitoring efforts and information could affect the larger fund family's stewardship

[3] Based on the authors' calculation and classification of individual funds (see Section 2), Vanguard's actively managed AUM in 2019 was $1.56 trillion, while Fidelity's was $1.61 trillion.

choices. Consistent with this possibility, anecdotal evidence suggests that active fund managers, especially star managers, exert influence over voting decisions of other fund managers within the same fund family.[4] Second, because managers of active funds can sell shares of poorly performing firms, active ownership may influence monitoring by centralized stewardship teams if the ability to exit lends credibility to alternative forms of intervention (e.g., Dasgupta and Piacentino, 2015; Levit, 2019) or acts as a substitute form of governance when exiting positions is more costly (e.g., Bhide, 1993).

To investigate the association between investor attention and degree of active ownership, we use fund family-level data on voting decisions by U.S. mutual funds from 2008 to 2018. The voting data is hand-matched using fund family names to the CRSP Mutual Fund Holdings database for fund families' ownership information. We define fund families as mutual fund companies (i.e., institutions or complexes) that market and distribute funds to retail investors. Following Iliev and Lowry (2015) and Gilje et al. (2020), we proxy for an institution's attention using votes that go against the recommendation of the proxy advisory firm Institutional Shareholder Services (ISS). This investor attention proxy is theoretically motivated (Malenko et al., 2022), and the underlying premise is that all else equal, attentive investors are less likely to rubber-stamp ISS recommendations. We measure active ownership as the proportion of a fund family's overall holdings in a stock that is held in its actively managed funds.

To mitigate concerns about portfolio weights' endogeneity, we partial out potential confounding factors that might drive differences in attention at the investor or proposal level. Specifically, we include proposal-level fixed effects in each estimation. Their inclusion accounts

[4] For example, in a 2015 vote on a merger between Towers Watson and Willis Group, "Proxy advisers Institutional Shareholder Services Inc. and Glass, Lewis & Co. both recommended voting against it. BlackRock's passive team leaned toward voting no, but portfolio managers at the firm's actively managed funds backed the deal, arguing that it would create more long-term value, said people familiar with the matter. The active managers persuaded their colleagues to do the same." (*The New York Times*, October 24, 2016).

for any firm- or proposal-level characteristics that affect institutions' likelihood of voting against the ISS recommendation, which allows us to isolate how votes on a given proposal vary across institutions as a function of their active equity holdings. We also include institution-by-month fixed effects to control for each institution's general tendency to vote against ISS and the possibility that this might vary over time. In other words, we only use within-month variation in each institution's active holdings and how it votes across proposals that month.

We find that greater active ownership is associated with a higher likelihood that the institutional investor votes against the ISS recommendation. This finding is economically sizable. According to our estimates, the likelihood of an investor voting against ISS is 7.6% higher when the stock is held solely by an institutions' actively managed funds relative to when the stock is instead solely held by its passively managed funds. Moreover, the estimates suggest that the economic importance of active ownership share for voting is similar in magnitude to those documented for overall investment size (e.g., see, Fich, Harford, and Tran, 2015).

The positive association between the proxy for investor attention and active ownership is not attributable to differences in the size of an institution's overall position. The share of a stock's position found in active funds could positively correlate with investment size if institutions tend to hold larger positions in stocks they actively trade. If true, differences in investment size, rather than active ownership shares, could potentially drive the observed correlations. However, we find that the positive active ownership-investor attention association remains equally strong after controlling for the importance of a stock in the investor's overall portfolio.

Evidence of greater investor attention to stocks with a larger active position also holds for The Big Three. Indeed, the association between active ownership and voting for The Big Three is similar in magnitude to the average magnitude observed for other institutional investors. These findings suggest that stocks held in an institutions' active fund portfolio are more likely to receive attention even when mutual fund families centralize their stewardship activities. Interestingly, The Big Three are also more likely to vote differently on stocks that are more important in their overall portfolio. A one standard deviation increase in the overall importance of a stock in their portfolio is associated with a six-percentage point increase in the likelihood of voting in ways suggesting greater attention, which is six times the economic magnitude observed for other institutions.

Finally, we show that the positive association between active ownership and our proxy for investor attention manifests not only in institutions' actively managed funds but also in their passively managed funds. Specifically, votes of an institution's passive funds are more likely disagree with ISS recommendations when a larger share of the institution's holdings in that stock originate from actively managed funds. This evidence suggests that there is a spillover from active fund ownership to the voting by passive funds within the same fund family. We also find that the association between active ownership and investor attention is larger for illiquid stocks, consistent with illiquidity making active funds threat of exit as a governance mechanism less credible thus increasing the institution's need for direct engagement via voice.

Overall, this paper contributes to the literature that studies the governance role of passive institutional investors. Many argue that these institutions lack the incentives or resources required to monitor firms effectively (e.g., Schmidt and Fahlenbrach, 2017; Bebchuk and Hirst, 2019b; Gilje et al., 2020; Heath et al., 2022), while others argue the opposite (Appel et al., 2016, 2019; Fisch et al., 2019; Kahan and Rock, 2020; Azar et al., 2021; Lewellen and Lewellen, 2022). Despite this debate, evidence increasingly suggests these institutions do engage in stewardship (e.g., Appel et al., 2016; Azar et al., 2021; Gormley et al., 2023) but the drivers of that engagement and what factors contribute to their attention are not well understood. Hypotheses regarding their engagement motives include self-dealing, attracting fund flows, staving off regulation, and their economically large positions (Barzuza et al., 2020; Fisch, 2022; Kahan and Rock, 2020; Lewellen and Lewellen, 2022). We contribute to this literature by highlighting their large active holdings, which can also provide a monitoring incentive, and by showing that passive institutions' actively managed positions predict how actively they will vote their overall shares. Our findings also complement existing studies that document the importance of a stock's weight in the investor's portfolio for monitoring intensity (e.g., Fich et al., 2015; Iliev et al., 2021) by showing that the relative split of that position across active and passive funds helps explain institutions' votes.

Our findings also connect to the literature studying governance mechanisms through which large shareholders influence managerial decisions. When institutional investors are unhappy with a firm's performance, they typically have two choices: (1) they can raise their voice to try to effectuate change ("voice" or direct intervention), or (2) they can leave the firm by selling shares ("exit"). Several theoretical models show these governance mechanisms can be complementary (e.g., Edmans and Manso, 2011; Dasgupta and Piacentino, 2015; Levit, 2019), while others show that they can be substitutes (e.g., Kahn and Winton, 1998). Our findings suggest that institutional investors exercise greater voice for stocks they have the option to exit (i.e., stocks held in actively managed funds), compared to stocks for which exit is less an option (i.e., stocks held in passively managed funds, where index weights drive ownership decisions). This finding supports theories that model exit and voice as complementary mechanisms. The findings are also consistent with McCahery, Sautner, and Starks (2016) and the hypothesis that "The chances for voice to function effectively … are appreciably strengthened if voice is backed up by the threat of exit," (Hirschman, 1970, p. 82), which can help explain why firms appear to give considerable weight to the voice of passive institutional investors (e.g., Azar et al., 2021; Gormley et al., 2023).

2.2 Sample, Data Sources, and Descriptive Statistics

2.2.1 Mutual Fund Holdings and Stock Market Data

Data on mutual fund holdings starting in December of 2007 are from the CRSP Mutual Fund Database. This database provides a comprehensive, survivor bias-free list of U.S. mutual funds. In the database, we have information on each fund, including its holdings, fund name, and total net assets. As part of the data cleaning process, we also determine and include the name of the fund family to which each fund belongs. The details of this process are provided in the Appendix. The database also provides an indicator variable to identify passive or index funds, but the coverage of this variable is limited. To augment the CRSP indicator for index funds, we follow Appel et al. (2016) and flag a fund as passively managed if its name contains a string that indicates the fund as an index fund or if the index fund indicator in the database is equal to one.

Holdings data in the CRSP Mutual Fund Database consist of quarterly mandatory disclosures and monthly voluntary disclosures. Since May 2004, all (open-end) mutual funds and exchange-traded funds (ETFs) traded on U.S. exchanges are required to report holdings quarterly to the Securities and Exchange Commission (SEC). Many fund families also voluntarily report holdings to CRSP and other data vendors on a monthly basis. We use both types of reports for our analysis. To ensure the value of holdings are calculated in a consistent manner, we use market prices from the date holdings were reported rather than the date CRSP obtained the holdings data.[5] We exclude holdings that are negative (i.e., short positions) from the baseline analysis, but our subsequent findings are robust to including these positions.

[5] Many observations use price on the "effective" date (date that CRSP obtained the information from source) instead of the "report" date (date of holdings as reported by CRSP's sources). The severity of this issue varies across years; about 70% of the observations in 2008 need the modification whereas about 3% of the observations in 2018 do so.

We restrict our sample to stocks listed on the NYSE, American Stock Exchange, or NASDAQ to match with the voting data (see Section 2.2). We confine our analysis to between 2008 and 2018 due to errors in the CRSP mutual fund file prior to 2008 (Schwarz and Potter, 2016).

The key explanatory variable for our analysis is the proportion of a fund family's holdings in each stock that is in their actively managed funds. Specifically, we define $ActiveTilt_{f,i,t}$ as the proportion of fund family f's holdings in stock i in month t that is held by their actively managed funds. When $ActiveTilt_{f,i,t} = 1$, the fund family's overall holdings in the stock are entirely in their actively managed funds. When $ActiveTilt_{f,i,t} = 0.7$, 70% of the fund family's overall holdings in the stock is in their actively managed funds and the remaining 30% is in their passively managed funds. We also construct $Inv_{f,i,t}$, which denotes the share of the fund family's overall holdings (i.e., the sum of active and passive holdings) that is held in that stock. Because *Inv* is known to predict voting patterns (e.g., Iliev and Lowry, 2015; Gilje et al., 2020; Iliev et al., 2021) and could correlate with *ActiveTilt*, we will control for it in our subsequent tests. We winsorize both ownership variables at the 1% level to mitigate the potential influence of outliers.

In a heterogeneity test, we measure a stock's illiquidity in each month following Amihud (2002) using returns and trading volume data from the CRSP daily stock return file.

2.2.2 Voting Data

We use voting data from the Institutional Shareholder Services (ISS) Voting Analytics database, which is based on the SEC form N-PX. Since April 2003, mutual funds are required to file with the SEC a complete proxy voting record on all shares they hold (e.g., whether and how the fund voted—for example, for or against the proposal, or abstain). The database provides both the votes cast by funds and the results for each proposal. Importantly, the data also provide ISS's vote recommendation—whether ISS recommended shareholders vote for or against a proposal.

Following the Iliev and Lowry (2015) and Gilje et al., (2020), we measure investor attention as the proportion of a fund family's votes on a particular proposal that went against what ISS recommended. Specifically, we define our main outcome, $Attention_{f,i,p,t}$, as the share of fund family f's votes on firm i's proposal p in month t that deviated from the ISS recommendation. Iliev and Lowry (2015) and Malenko and Malenko (2019) posit that if fund families devote more resources towards becoming informed, they will be less likely to follow proxy advisory recommendations indiscriminately. Malenko, Malenko, and Spatt (2022) also show that voting against ISS is an equilibrium outcome for more attentive investors when ISS uses its vote recommendations to create controversy. Consistent with this possibility, Iliev and Lowry (2015) observe a greater likelihood of disagreeing with ISS for mutual funds where the net benefits of being attentive are greater. Moreover, Iliev, Kalodimos, and Lowry (2021) find that this voting behavior positively correlates with an institutional investor becoming informed before a vote.

Like earlier papers, we also limit our baseline sample to contentious shareholder proposals (i.e., votes where the ISS recommendation differs from that of management). We exclude non-contentious proposals because they are typically not well-thought-out (Gantchev and Giannetti, 2021) and because investors do not appear to focus on them (Iliev et al., 2021). A similar logic applies to excluding management proposals, which are primarily perfunctory and less revealing about investor attention (Iliev and Lowry, 2015; Gilje et al., 2020).

2.2.3 Sample and Descriptive Statistics

For our final sample, we manually match the voting data to the CRSP database using fund family names. In the end, our sample consists of 376,325 institution-by-proposal level voting records for 4,901 unique contentious shareholder proposals from 1,071 different firms, which were voted on by 461 mutual fund families during 2008-2018.

Panel A of Table 1 reports summary statistics for our main sample of contentious, shareholder proposals. On average, each voted position accounts for 0.19% of fund family's overall holdings, and the average share of a voted position held in active funds is 63.6%. Institution-level attention (as proxied by the proportion of a fund family's votes that deviates from the ISS recommendation) for the average contentious shareholder-sponsored proposal is 38.4%. Panel B of Table 1 reports summary statistics for the full sample of proposals. Consistent with investors being less attentive to other types of proposals, the measure of attention is considerably lower for the full sample, averaging just 8.15%. Average aggregate and active holdings are also smaller than in Panel A, and *ActiveTilt* averages 56.5%.

2.3 Empirical Framework

Our primary interest is whether a fund family's attention to a stock varies with a fund family's active ownership in the stock. To analyze this possibility, we estimate the following proposal-level panel regression:

$$Attention_{f,i,p,t} = \beta ActiveTilt_{f,i,t} + \theta Inv_{f,i,t} + \gamma_{f,t} + \delta_p + \varepsilon_{f,i,p,t}, \qquad (1)$$

where f indexes fund families, i indexes stocks (firms), p indexes proposals, and t indexes months. The variable $Attention_{f,i,p,t}$ again represents our measure of investor attention paid by fund family f' to firm i's proposal p in month t, while $ActiveTilt_{f,i,t}$ is the proportion of fund family f's holdings in stock i that is in their actively managed funds in month t. To facilitate interpretation of the estimated coefficients on *ActiveTilt* and *Inv*, we scale both variables by their sample standard deviations so that the point estimates reflect the observed difference in $Attention_{f,i,p,t}$ for a one standard deviation increase in each explanatory variable.

Our main identification concern is that of omitted variables. Suppose *ActiveTilt* correlates with proposal-, firm-, or institution-level characteristics that affect an institution's likelihood of actively voting its shares (i.e., not blindly following the ISS recommendation). In that case, our estimate of interest, β, could reflect these omitted variables rather than an effect of active holdings on investor attention. For example, if institutions tend to hold larger active positions in better-run companies and such companies are also those where institutions are more likely to vote against ISS recommendations, a positive correlation between *ActiveTilt* and *Attention* could exist even if actively managed fund holdings do not affect institutions' stewardship activities.

However, including proposal and institution-by-month fixed effects allows us to control for many of these potential omitted factors. The proposal-level fixed effects control for any proposal-level characteristics that could affect institutions' likelihood of following ISS, including the proposal's type and content. The proposal fixed effects also control for any firm characteristics (e.g., profitability and size) at the time of the vote that might matter for how institutions vote on a particular proposal. The institution-by-month fixed effects control for any differences in an institution's overall tendency to be "pro-management" (e.g., Brav, Jiang, Li, and Pinnington, 2021; Kedia, Starks, and Wang, 2021), while also allowing for this tendency to change over time. Hence, our coefficient of interest, β, is identified using variation in how votes for a given proposal vary as a function of each institution's active fund holdings in each month.

However, these fixed effects will not control for all potential omitted variables. For example, they do not control for other factors that might exhibit cross-sectional variation across an institution's holdings at a particular point in time that both affect the likelihood of an institution voting against ISS and correlate with *ActiveTilt*. One potential such factor is how important that firm's stock is in the institution's overall portfolio, *Inv*, which could correlate with *ActiveTilt* and affect institutions' monitoring (e.g., Fich, Harford, and Tran, 2015; Iliev and Lowry, 2015). For this reason, we also include *Inv* as an additional control.

2.4 Results: Active Ownership and Institutional Investor Attention

2.4.1 Baseline Results

To assess how active fund holdings might influence institutions' level of attention, we start by estimating a version of eq. (1) that excludes the *Inv* control. This estimation determines the baseline association between an institution's active fund holdings in a company and the share of an institution's funds that vote against ISS for a company's proposals after controlling for proposal and institution-by-month fixed effects. Table 2, column 1 reports the findings.

Institutions with a larger share of their position in active funds are more likely to vote against the ISS recommendation. Specifically, a one standard deviation (i.e., 0.43) increase in active ownership is associated with a 1.25 percentage point increase in the likelihood the investor does not follow the recommendation of ISS in contentious shareholder proposals. The estimate is economically important: the likelihood of an investor being attentive is 7.6% higher for stocks in purely active funds, on average, than for stocks in purely passive funds.[6]

[6] A 2.3-standard deviation difference on the scaled variable of active ownership corresponds to a difference of 1 on the original variable (i.e., the difference between a stock that is only in active funds and a stock that is only in passive

The positive association between active holdings and voting is robust to controlling for the proportion of an institution' portfolio held in the firm's equity (Table 2, column 2). The coefficient on active ownership falls by a negligible 0.1 percentage point when *Inv* is added as a control. Moreover, as can be seen by comparing the two coefficients in column 2, the relative importance of the active/passive split (the focus of our paper) is of similar economic magnitude to that of a stock's overall importance in a fund family's portfolio (the focus of previous papers). In other words, after controlling for proposal and firm characteristics at the time of the vote (as done by including the proposal fixed effects), an institution's overall tendency to disagree with ISS (as done by including institution-by-month fixed effects), *and* the institution's equity position size, institutions are more attentive voters when a larger share of the equity is held in active funds.

2.4.2 The Big Three

The previous section illustrates that a fund family's active holdings can help predict institutional voting patterns across all U.S. mutual fund families. In this section, we turn attention to the largest three institutional investors that offer passively managed funds—BlackRock, Vanguard, and State Street—to analyze whether the proportion of their holdings held in actively managed funds also predicts their likelihood of voting in ways suggesting greater attention.

These three fund families typically centralize voting for both active and passive funds, and the internal agreement in voting among funds within each complex is high. In our sample, all funds within a Big Three institution cast the same vote on 84.3% of proposals. However, because the

funds). A 2.3-standard deviation increase in active ownership corresponds to a 2.9 (= 1.25*2.3) percentage point increase in the likelihood the investor is attentive. Given that the mean of the likelihood the investor is attentive is 38%, a 2.9 percentage point increase corresponds to a 7.6% increase in the average likelihood.

centralized governance teams in charge of voting likely consult fund managers in advance of a vote, the mixture of the institution's holdings across active and passive funds could matter the centralized governance team's level of attention. And, in the process of making final voting decisions, they could encounter situations where they need to favor active over passive funds, or vice versa, considering the net benefits of doing so (Griffith and Lund, 2019).

Given their large ownership stakes and potential to exert considerable influence via their votes (e.g., see Appel et al., 2016; Gormley et al., 2023), it is important to understand whether The Big Three's level of attention is affected by their active holdings. The analysis might also help shed light on whether The Big Three's large active holdings are a potential driver of their stewardship activities, where the underlying motives are highly debated.[7] To test whether active holdings predict a differential level of attention for The Big Three, we add an interaction between *ActiveTilt* and *BigThree,* which is a dummy variable that equals 1 for each Big Three fund family and 0 otherwise. Table 3 reports the coefficients of this estimation.

The Big Three institutions are also more likely to vote in ways suggesting greater attention when a larger proportion of their holdings are in active funds. Table 3, column 1 shows that the relative importance of active holdings for predicting investor attention is similar for The Big Three investors; the coefficient for interaction between *ActiveTilt* and *BigThree* is not statistically significant. If anything, the positive interaction coefficient suggests that active holdings are more predictive of attentive voting for The Big Three institutions. The interaction coefficient remains

[7] See Barzuza et al., (2020), Fisch (2022), Kahan and Rock (2020), and Lewellen and Lewellen (2022) for a discussion of possible motives for The Big Three's stewardship activities, which include self-dealing, attracting fund flows, staving off regulation, and their economically large positions. To our knowledge, the possibility that their actively managed holdings might also provide a motive to be engaged owners has not been formally discussed.

positive but statistically indistinguishable from zero after controlling for the importance of the stock in the investor's overall portfolio, *Inv* (Column 2).

Another important and interesting analysis that the prior literature has yet studied is whether the correlation between the importance of a stock in an investor's overall portfolio (*Inv*) and investor attention differs for The Big Three. The Big Three investors hold very large and diverse portfolios in which they hold almost every listed stock in the U.S. Given the limited resources they dedicate to stewardship activities (e.g., Bebchuk and Hirst, 2019b) and their especially diverse portfolios, they might be even more inclined than the average institutional investor to focus mainly on the stocks that are most important in their overall portfolios.

We find evidence consistent with The Big Three giving greater attention to their largest positions. Consistent with the extant literature, we find that institutions tend to vote in ways suggesting greater attention when a position represents a larger share of their overall portfolio (Table 4, Column 1). The point estimate on *Inv* is 0.008, indicating that a one standard deviation increase in a position's share of the overall portfolio is associated with a 0.8 percentage point increase in the likelihood the institution's vote goes against the ISS recommendation (Table 4, Column 1). However, the positive coefficient for *Inv*×*BigThree* indicates that the association is even larger for The Big Three. Specifically, a one standard deviation in the importance of a stock in a Big Three's overall portfolio is associated with a 6-percentage point increase (0.008 + 0.052) in their likelihood of voting in a way suggesting greater attention, which is 8 times the economic magnitude observed for other investors. The larger association for The Big Three remains even when controlling for the share of their position held in active funds (Column 2).[8]

[8] In untabulated tests where we replace the *BigThree* interaction in Table 4 with an interaction that uses the percentage of fund family's assets that are passively managed, we find no evidence that the share of passively managed assets

2.4.3 Controlling for Active Position Size

Adding an alternative control for an institution's active position size does not affect our main findings. To illustrate this finding, we now measure a fund family's active position size in a stock using the percentage of the institution's *actively managed* AUM that the active holding represents (*ActiveInv*). Like other explanatory variables, we scale *ActiveInv* by its sample standard deviation. Including this additional control for active position size, along with the traditional measure of position size (*Inv*), has little impact on the predictive ability of *ActiveTilt*. Table 5 reports these findings. We continue to find that increases in *ActiveTilt* predict a higher likelihood of the institution not following the ISS vote recommendation (Table 5, column 1). And *ActiveInv* itself has no incremental predictive power for institutions' voting patterns.

However, we do find that both measures of position size, *Inv* and *ActiveInv*, positively predict attentive voting patterns for The Big Three investors. Table 5, Column 2 which includes interactions of these size controls with our Big Three dummy variable, shows these findings. Relative to estimates of *Inv* and *ActiveInv* for non-Big Three families, the association between voting and *Inv* and *ActiveInv* for The Big Three is significantly greater. The estimates are also economically large. For example, a one standard deviation increase in active position size (*ActiveInv*) is associated with an 8.9 percentage point increase in the likelihood that a Big Three investor does not follow the ISS recommendation. These results provide additional evidence that both position size and the share of active holdings significantly influence the amount of attention The Big Three indexers take when voting individual positions.

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provides additional explanatory power for either the *Inv* or *ActiveTilt* of an institution. That is, the result reported in Table 4 is specific to The Big Three institutions and not an institution's overall share of passively managed assets.

Overall, these results show that The Big Three institutions pay more attention when voting shares that are held by actively managed funds within the family. Our findings also suggest that the magnitude of the active ownership-investor attention association for The Big Three is not statistically different from that for other institutional investors. However, The Big Three have a stronger tendency to focus attention on stocks that account for a greater percentage of their overall portfolio and a greater percentage of their overall active portfolios, likely due to their limited stewardship resources combined with the large number of stocks they hold.

2.4.4 Spillover from Active Funds to Passive Funds

While we have shown that active holdings are associated with evidence of increased investor attention at fund family level, we have not examined whether the association between active ownership and investor attention holds for both active funds and passive funds. Votes cast by the fund family's actively managed funds could solely drive the earlier findings, which analyze the fund family's overall share of votes cast against ISS. However, because many large fund families have centralized voting system in which they vote all their shares (i.e., both active and passive shares) as a block, we might expect the fund family's level of active ownership to also influence how attentively the shares of its passive funds are voted.

To assess a possible spillover from active holdings to the voting of passive funds, we return to our baseline estimation but now separately estimate the specification for actively and passively managed funds. If an institution's active holdings influence how attentively its passive funds are voted, we would expect to find *ActiveTilt* to also predict an increased likelihood of voting against ISS in the sample of passively managed funds. Table 6 reports these estimates.

We find evidence that greater active ownership is associated with increased attention by passive funds within the same fund family. Restricting our estimation to votes cast by passive funds, we continue to find that the stock-level A*ctiveTilt* for the fund family's position predicts an increased likelihood of voting against ISS (Table 6, Panel A, Column 1). This suggests that the influence of active holdings on voting behavior is not limited to active funds and extends further to passive funds within fund family. The point estimate remains positive and statistically significant even when controlling for the importance of stocks in fund family's overall portfolio (Column 2). Interestingly, we find no evidence that the institution's overall exposure to a stock (as captured by *Inv*) predicts more attentive voting by its passive funds. Therefore, active funds within fund family appear to drive the positive ownership-investor attention relation that previous studies document (e.g., Iliev and Lowry, 2015; Gilje, Gormley, and Levit, 2019). As expected, an institution's *ActiveTilt* positively predicts attentive voting by its active funds (Table 6, Panel B).

2.5 Heterogeneity

While our measure of investor attention focuses on the use of "voice" to exert governance, active investors can also exert governance via exit (e.g., Admati and Pfleiderer, 2009; Edmans, 2009). In this section, we explore whether the magnitude of the association between active ownership and our proxy for investor attention varies with the liquidity of the stock, which effects investors' ability to exercise governance via exit, and hence, their potential use of voice.

The relationship between governance via voice and liquidity is theoretically ambiguous. On the one hand, liquidity may disincentivize active managers from exerting voice because they can exit the position relatively easily rather than bear costs associated with intervention via voice (e.g., Bhide, 1993). If we interpret our measure of investor attention as institution's exercising voice, such theories suggest our findings should be less (more) pronounced for liquid (illiquid) stocks. On the other hand, because liquidity makes it easier to earn trading gains from voice intervention, it could increase the use institution's use of voice (e.g., Maug, 1998). If true, our findings should be more (less) pronounced for liquid (illiquid) stocks.

To analyze whether our findings vary with stock liquidity, we repeat our baseline analysis, allowing the effect of active ownership to vary with a stock's average monthly illiquidity. Specifically, we measure daily stock illiquidity following Amihud (2002) using the average ratio of the daily absolute return to the dollar trading volume on that day. We then construct *Illiquidity* using the monthly average of the daily stock illiquidity and add an interaction between this *Illiquidity* and *ActiveTilt* to our base specification. The specification's proposal fixed effects will control for the direct impact of illiquidity on voice. Table 7 reports the estimates.

Consistent with the view that stock illiquidity can strengthen the need for voice, we find that illiquid stocks exhibit a stronger association between active ownership and investor attention. The coefficient on the interaction between *ActiveTilt* and *Illiquidity* is positive, indicating institutions are even more likely to vote in ways suggesting greater attention when their active position share increases for a more illiquid stock (Table 7, Column 1). In our baseline test, we use a stock's current month Amihud measure of illiquidity, which could raise concerns if trading patterns vary in the days around votes and possibly affect the illiquidity measure. However, the findings are robust to using the prior month's illiquidity (Column 2).

2.6 Robustness Checks

In our baseline analysis, we exclude institution's short positions (i.e., holdings with reported negative values). We make this exclusion for two reasons. First, without this exclusion, one might expect a non-monotonic association between *Attention* and *Inv* if investors pay more attention to positions as *Inv* increases in absolute magnitude. Such non-monotonicity would imply our baseline estimation is mis-specified when including short positions. Second, it is also unclear how one should count short positions toward a fund families' total net assets (TNA).

Nevertheless, our findings are not sensitive to how we treat short positions. To illustrate this robustness, we repeat our main estimation treating short positions in several ways. Specifically, we repeat our baseline test when: (1) keeping short positions, (2) dropping short positions and making no changes in TNA (our baseline and preferred approach), (3) dropping short positions and adding back the negative holdings to TNA, (4) converting short positions into long positions (i.e., treating short positions as long positions) and making no changes in TNA, and (5) converting short positions into long positions and changing TNA as if the short positions were originally long positions. Table 8 reports the results of these five different approaches for short positions. As can be seen, our findings are not sensitive to how we treat the short positions.

Clustering our standard errors by fund family and proposal, rather than by fund family only, also does not qualitatively affect our findings. The double clustering tends to yield lower (i.e., less conservative) standard errors. Table 9 reports these estimates.

2.7 Conclusion

The dramatic rise of passive investors in Corporate America's equity ownership and its impact on firms' governance has provoked some concerns that are widely debated. One of these concerns is whether passive institutional investors have sufficient incentives to engage with portfolio firms when they primarily compete on delivering the return of a benchmark index (e.g., S&P 500) with minimal expenses and tracking error. Despite this concern, evidence suggests that such passive institutions do engage in various stewardship activities. This paper offers a potential explanation: passive institutions, including The Big Three, also maintain large active holdings, which can provide a motive for those institutions to be engaged owners. Specifically, we explore whether active ownership, as measured by the proportion of an institution's holdings in a stock that is in actively managed funds, affects the institution's overall attention to the firm.

We show that higher active ownership in a stock associates with a higher likelihood that the institutional investor votes in ways suggesting it is attentive to that stock. We also show that The Big Three passive investors—BlackRock, State Street, and Vanguard—also follow this empirical pattern despite their use of centralized voting. Further, our results confirm the findings of previous research that show institutional monitoring is greater when the firm represents a more significant allocation in the institution's portfolio (e.g., Fich, Harford, and Tran, 2015; Iliev and Lowry, 2015; Gilje, Gormley, and Levit, 2020). Interestingly, we show that this tendency to focus attention on stocks that are important in the overall portfolio is significantly stronger for The Big Three, possibly reflecting a strategic monitoring choice given their vastly diversified portfolios.

Our findings suggest the active holdings of passive institutions provide an important source of monitoring incentives. Our results, however, also suggest that, all else equal, institutions with passively managed positions are less likely to be engaged than institutions with only actively managed funds. The findings also raise important questions regarding the potential impact on passive institutions' monitoring incentives from recent efforts to divest vote decisions to individual fund managers or investors rather than a centralized governance division. For example, in 2019, Vanguard announced that its outside fund supervisors (which oversee its actively managed funds) would now be making their own vote decisions.[9] Such changes could negatively impact an overall institution's level of engagement if the centralized governance division that makes decisions on how to vote the institution's passive positions no longer hears the views of fund managers that maintain an active position. More research is needed to answer questions regarding the interactions between fund managers—especially active fund managers—and the stewardship team.

[9] For example, see https://www.cnbc.com/2019/04/25/vanguard-to-give-up-some-of-its-voting-power-to-external-fund-managers.html.

2.8 Appendix

Our mutual fund holdings dataset is the CRSP Mutual Fund Database provided by Wharton Research Data Services (WRDS). The dataset provides various fund-level information. Below, we summarize how we aggregate funds to a fund family. A fund family is defined as an institution or complex that markets and distributes funds to individual investors.

To determine the name of the fund family to which each fund belongs, we primarily use the variables “mgmt_name” (management company name) and “mgmt_cd” (management company number) in the CRSP Database. These variables, however, exhibit various errors and inconsistencies, including (i) spelling errors in the “mgmt_name” variable; (ii) missing values in both variables; (iii) inconsistent labeling of the type of an institution in the “mgmt_name” variable (e.g., LLC and L.L.C. for a limited liability company); and (iv) inconsistent use of abbreviations (e.g., ‘co’ for company and ‘inv mgmt’ for investment management).

Additionally, it is worthwhile to note that, although in many cases, ‘management company’ in the dataset corresponds to our definition of ‘fund family,’ a fund family often manages several management companies. In such cases, the management company name is replaced by a larger fund family name for the fund. To address these aforementioned issues, we manually check each fund’s family name by referring to the management company number, fund name, and manager names, and other relevant information.

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Table 1

Summary Statistics

This table provides summary statistics of our key variables for our main sample. Attention is at the fund family-proposal level and ownership is at the fund family-stock level. Ownership variables are winsorized at the 1% level, and we delete observations where mutual fund family's ownership in a stock is negative (i.e., a short position). Attention, $Attention_{f,i,p,t}$, is proxied by the proportion of a fund family's votes on a proposal which deviates from the recommendation of ISS. Fund family ownership, $Inv_{f,i,t}$, is the ratio of a fund family's overall holdings (i.e., the sum of active and passive holdings) in a stock to total net asset (TNA) of the fund family's overall portfolio. $ActiveInv_{f,i,t}$ is the ratio of a fund family's active holdings in a stock to TNA of the fund family's overall portfolio. Our main variable of interest, $ActiveTilt_{f,i,t}$, is the proportion of a fund family's holdings in a stock that is in their actively managed funds.

Panel A: Contentious shareholder proposals

	Obs.	Mean	Median	SD	25^{th} Pct	75^{th} Pct
Voting against ISS ($Attention_{f,i,p,t}$)	376,325	0.384	0	0.460	0	1
Fund family ownership ($Inv_{f,i,t}$)	269,485	0.00187	0.000377	0.00364	0.000062	0.00171
Fund family active ownership ($ActiveInv_{f,i,t}$)	269,485	0.00166	0.00019	0.00356	2.48e-06	0.00136
Fund family tilt towards active ownership ($ActiveTilt_{f,i,t}$)	269,485	0.636	0.929	0.431	0.0494	1

Panel B: All proposals

	Obs.	Mean	Median	SD	25^{th} Pct	75^{th} Pct
Voting against ISS ($Attention_{f,i,p,t}$)	1.668e+07	0.0815	0	0.265	0	0
Fund family ownership ($Inv_{f,i,t}$)	1.213e+07	0.000847	7.44e-05	0.00248	9.68e-06	0.000429
Fund family active ownership ($ActiveInv_{f,i,t}$)	1.213e+07	0.000771	0.000023	0.00243	0	0.000317
Fund family tilt towards active ownership ($ActiveTilt_{f,i,t}$)	1.213e+07	0.565	0.827	0.458	0	1

Table 2

Active Ownership and the Likelihood of Investor Being Attentive
(Baseline results based on contentious shareholder proposals)

This table reports estimates of a regression of mutual fund attention on a measure of active ownership plus control variables. Specifically, we estimate

$$Attention_{f,i,p,t} = \beta ActiveTilt_{f,i,t} + Inv_{f,i,t} + \gamma_{f,t} + \delta_p + \varepsilon_{f,i,p,t},$$

where $Attention_{f,i,p,t}$ is the proportion of fund family f's votes on firm i's proposal p in month t which deviated from the recommendation of ISS, $ActiveTilt_{f,i,t}$ is the proportion of fund family f's holdings in stock i that is in their actively managed funds in month t scaled by its sample standard deviation, $Inv_{f,i,t}$ is the ratio of a fund family's overall holdings (i.e., the sum of active and passive holdings) in a stock to TNA of the fund family's overall portfolio scaled by its sample standard deviation, $\gamma_{f,t}$ represents fund family-month fixed effects, and δ_p represents proposal fixed effects. The voting and holdings data come from ISS and the CRSP Mutual Fund Holdings Database, respectively, and we match them. The model is estimated over the 2008–2018 period. The sample excludes observations where mutual fund family's ownership in a stock is negative. Standard errors, ε, are clustered at the fund family level and reported in parentheses. ** indicates significance at the 5% level.

Dependent variable =	$Attention_{f,i,p,t}$	
	(1)	(2)
$ActiveTilt_{f,i,t}$	0.0125**	0.0115**
	(0.00561)	(0.00563)
$Inv_{f,i,t}$		0.01000**
		(0.00391)
Fund family-month fixed effects	yes	yes
Proposal fixed effects	yes	yes
Observations	269,485	269,485
R-squared	0.562	0.562

Table 3

The Big Three Investors: Active Ownership and Likelihood of Investor Being Attentive
(Based on contentious shareholder proposals)

This table repeats the analysis of Table 2, with the addition of the measure of active ownership interacted with an indicator for being one of The Big Three investors. Specifically, we estimate

$$Attention_{f,i,p,t} = \beta\{ActiveTilt_{f,i,t}, ActiveTilt_{f,i,t} \times The\ Big\ Three_f\} + Inv_{f,i,t} + \gamma_{f,t} + \delta_p + \varepsilon_{f,i,p,t},$$

where $Attention_{f,i,p,t}$ is the proportion of fund family f's votes on firm i's proposal p in month t which deviated from the recommendation of ISS, $ActiveTilt_{f,i,t}$ is the proportion of fund family f's holdings in stock i that is in their actively managed funds in month t scaled by its sample standard deviation, $The\ Big\ Three_f$ is a dummy variable of 1 if fund family f is one of The Big Three and 0 otherwise, $Inv_{f,i,t}$ is the ratio of a fund family's overall holdings (i.e., the sum of active and passive holdings) in a stock to TNA of the fund family's overall portfolio scaled by its sample standard deviation, $\gamma_{f,t}$ represents fund family-month fixed effects, and δ_p represents proposal fixed effects. The voting and holdings data come from ISS and the CRSP Mutual Fund Holdings Database, respectively, and we match them. The model is estimated over the 2008–2018 period. The sample excludes observations where mutual fund family's ownership in a stock is negative. Standard errors are clustered at the fund family level and reported in parentheses. The symbols * and ** indicate significance at the 10% and 5% levels, respectively.

Dependent variable =	$Attention_{f,i,p,t}$	
	(1)	(2)
$ActiveTilt_{f,i,t}$	0.0122**	0.0112*
	(0.00578)	(0.00580)
$ActiveTilt_{f,i,t} \times BigThree_f$	0.0102	0.0114
	(0.0147)	(0.0145)
$Inv_{f,i,t}$		0.0100**
		(0.00390)
Fund family-month fixed effects	yes	yes
Proposal fixed effects	yes	yes
Observations	269,485	269,485
R-squared	0.562	0.562

Table 4

The Big Three Investors: Ownership and Likelihood of Investor Being Attentive
(Based on contentious shareholder proposals)

This table repeats the analysis of Table 2, with the addition of the measure of active ownership, as well as the measure of ownership, both interacted with an indicator for being one of The Big Three investors. Specifically, we estimate

$$Attention_{f,i,p,t} = \beta\{ActiveTilt_{f,i,t}, ActiveTilt_{f,i,t} \times BigThree_f, Inv_{f,i,t}, Inv_{f,i,t} \times BigThree_f\} + \gamma_{f,t} + \delta_p + \varepsilon_{f,i,p,t},$$

where $Attention_{f,i,p,t}$ is the proportion of fund family f's votes on firm i's proposal p in month t which deviated from the recommendation of ISS, $ActiveTilt_{f,i,t}$ is the proportion of fund family f's holdings in stock i that is in their actively managed funds in month t scaled by its sample standard deviation, $BigThree_f$ is a dummy variable of 1 if fund family f is one of The Big Three and 0 otherwise, $Inv_{f,i,t}$ is the ratio of a fund family's overall holdings (i.e., the sum of active and passive holdings) in a stock to TNA of the fund family's overall portfolio scaled by its sample standard deviation, $\gamma_{f,t}$ represents fund family-month fixed effects, and δ_p represents proposal fixed effects. The voting and holdings data come from ISS and the CRSP Mutual Fund Holdings Database, respectively, and we match them. The model is estimated over the 2008–2018 period. The sample excludes observations where mutual fund family's ownership in a stock is negative. Standard errors are clustered at the fund family level and reported in parentheses. The symbols ** and *** indicate significance at the 5% and 1% levels, respectively.

Dependent variable =	$Attention_{f,i,p,t}$	
	(1)	(2)
$ActiveTilt_{f,i,t}$	0.0118**	0.0116**
	(0.00560)	(0.00578)
$ActiveTilt_{f,i,t} \times BigThree_f$		0.00829
		(0.0117)
$Inv_{f,i,t}$	0.00843**	0.00847**
	(0.00397)	(0.00397)
$Inv_{f,i,t} \times BigThree_f$	0.0523***	0.0520***
	(0.0120)	(0.0115)
Fund family-month fixed effects	yes	yes
Proposal fixed effects	yes	yes
Observations	269,485	269,485
R-squared	0.562	0.562

Table 5

The Big Three Investors: Active Ownership Using Alternative Measure and Likelihood of Investor Being Attentive
(Based on contentious shareholder proposals)

This table repeats the analysis of Table 4 where we instead use an alternative measure of active ownership *ActiveInv*, which is defined as the ratio of active holdings in a stock to the fund family's total active portfolio. We control for our main active ownership measure, *ActiveTilt,* as well as the measure of ownership *Inv*. Specifically, we estimate

$$Attention_{f,i,p,t} = \beta\{ActiveTilt_{f,i,t}, Inv_{f,i,t}, ActiveInv_{f,i,t}, Inv_{f,i,t}\times BigThree_f, ActiveInv_{f,i,t}\times BigThree_f\} + \gamma_{f,t} + \delta_p + \varepsilon_{f,i,p,t},$$

where $Attention_{f,i,p,t}$ is the proportion of fund family f's votes on firm i's proposal p in month t which deviated from the recommendation of ISS, $ActiveTilt_{f,i,t}$ is the proportion of fund family f's holdings in stock i that is in their actively managed funds in month t scaled by its sample standard deviation, $BigThree_f$ is a dummy variable of 1 if fund family *f* is one of The Big Three and 0 otherwise, $Inv_{f,i,t}$ is the ratio of a fund family's overall holdings (i.e., the sum of active and passive holdings) in a stock to TNA of the fund family's overall portfolio scaled by its sample standard deviation, $\gamma_{f,t}$ represents fund family-month fixed effects, and δ_p represents proposal fixed effects. The voting and holdings data come from ISS and the CRSP Mutual Fund Holdings Database, respectively, and we match them. The model is estimated over the 2008–2018 period. The sample excludes observations where mutual fund family's ownership in a stock is negative. Standard errors are clustered at the fund family level and reported in parentheses. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable =	$Attention_{f,i,p,t}$	
	(1)	(2)
$ActiveTilt_{f,i,t}$	0.0115**	0.0115**
	(0.00563)	(0.00563)
$Inv_{f,i,t}$	0.00922**	0.00712*
	(0.00393)	(0.00396)
$ActiveInv_{f,i,t}$	0.00169	0.00297
	(0.00215)	(0.00196)
$Inv_{f,i,t}\times BigThree_f$		0.0429***
		(0.00846)
$ActiveInv_{f,i,t}\times BigThree_f$		0.0888***
		(0.0213)
Fund family-month fixed effects	yes	yes
Proposal fixed effects	yes	yes
Observations	269,485	269,485
R-squared	0.562	0.562

Table 6

"Spillover" from Active Funds to Passive Funds
(Based on contentious shareholder proposals)

This table repeats the analysis of Table 2. Specifically, we estimate

$$Attention_{f,i,p,t} = \beta ActiveTilt_{f,i,t} + Inv_{f,i,t} + \gamma_{f,t} + \delta_p + \varepsilon_{f,i,p,t},$$

where $Attention_{f,i,p,t}$ is the proportion of fund family f's votes on firm i's proposal p in month t which deviated from the recommendation of ISS, $ActiveTilt_{f,i,t}$ is the proportion of fund family f's holdings in stock i that is in their actively managed funds in month t scaled by its sample standard deviation, $Inv_{f,i,t}$ is the ratio of a fund family's overall holdings (i.e., the sum of active and passive holdings) in a stock to TNA of the fund family's overall portfolio scaled by its sample standard deviation, $\gamma_{f,t}$ represents fund family-month fixed effects, and δ_p represents proposal fixed effects. The voting and holdings data come from ISS and the CRSP Mutual Fund Holdings Database, respectively, and we match them. The model is estimated over the 2008–2018 period. The sample excludes observations where mutual fund family's ownership in a stock is negative. Panel A and B of this table restrict the sample to active funds and passive funds, respectively. Standard errors are clustered at the fund family level and reported in parentheses. The symbols *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Passive funds

Dependent variable =	$Attention_{f,i,p,t}$	
	(1)	(2)
$ActiveTilt_{f,i,t}$	0.00835*	0.00824*
	(0.00455)	(0.00456)
$Inv_{f,i,t}$		0.000490
		(0.00355)
Fund family-month fixed effects	yes	yes
Proposal fixed effects	yes	yes
Observations	146,821	146,821
R-squared	0.560	0.560

Panel B: Active funds

Dependent variable =	$Attention_{f,i,p,t}$	
	(1)	(2)
$ActiveTilt_{f,i,t}$	0.0120**	0.0113**
	(0.00483)	(0.00485)
$Inv_{f,i,t}$		0.0111***
		(0.00409)
Fund family-month fixed effects	yes	yes
Proposal fixed effects	yes	yes
Observations	234,387	234,387
R-squared	0.567	0.567

Table 7

Comparison by Stock Illiquidity
(Based on contentious shareholder proposals)

This table repeats the analysis of Table 2, with the addition of the measure of active ownership interacted with Amihud illiquidity measure. Specifically, we estimate

$$Attention_{f,i,p,t} = \beta\{ActiveTilt_{f,i,t}, ActiveTilt_{f,i,t} \times Illiquidity_{f,t}\} + Inv_{f,i,t} + \gamma_{f,t} + \delta_p + \varepsilon_{f,i,p,t},$$

where $Attention_{f,i,p,t}$ is the proportion of fund family f's votes on firm i's proposal p in month t which deviated from the recommendation of ISS, $ActiveTilt_{f,i,t}$ is the proportion of fund family f's holdings in stock i that is in their actively managed funds in month t scaled by its sample standard deviation, $Inv_{f,i,t}$ is the ratio of a fund family's overall holdings (i.e., the sum of active and passive holdings) in a stock to TNA of the fund family's overall portfolio scaled by its sample standard deviation, $\gamma_{f,t}$ represents fund family-month fixed effects, and δ_p represents proposal fixed effects. The voting and holdings data come from ISS and the CRSP Mutual Fund Holdings Database, respectively, and we match them. The model is estimated over the 2008–2018 period. The sample excludes observations where mutual fund family's ownership in a stock is negative. Standard errors are clustered at the fund family level and reported in parentheses. The symbols * and *** indicate significance at the 10% and 1% levels, respectively.

Dependent variable =	$Attention_{f,i,p,t}$	
	(1) Same month	(2) Prior month
$ActiveTilt_{f,i,t}$	0.0102* (0.00571)	0.0102* (0.00570)
$Inv_{f,i,t}$	0.0105*** (0.00394)	0.0105*** (0.00394)
$ActiveTilt_{f,i,t}$ $\times Illiquidity_{f,t}$	0.00545*** (0.00164)	0.00559*** (0.00161)
Fund family-month fixed effects	yes	yes
Proposal fixed effects	yes	yes
Observations	251,143	251,143
R-squared	0.567	0.567

Table 8

Robustness of Findings to Using Alternative Ways to Treat Short Positions
(Based on contentious shareholder proposals)

This table repeats the analysis of Table 4, using alternative ways to treat short positions in the data: (1) keep short positions, (2) drop short positions and make no changes in TNA (default version of our analysis), (3) drop short positions and add back the negative holdings to TNA, (4) convert short positions into long positions (i.e., treating short positions as long positions) and make no changes in TNA, and (5) convert short positions into long positions and change TNA as if the short positions were originally long positions. Specifically, we estimate

$$Attention_{f,i,p,t} = \beta\{ActiveTilt_{f,i,t}, ActiveTilt_{f,i,t} \times The\ Big\ Three_f, Inv_{f,i,t}, Inv_{f,i,t} \times BigThree_f\} + \gamma_{f,t} + \delta_p + \varepsilon_{f,i,p,t},$$

where $Attention_{f,i,p,t}$ is the proportion of fund family f's votes on firm i's proposal p in month t which deviated from the recommendation of ISS, $ActiveTilt_{f,i,t}$ is the proportion of fund family f's holdings in stock i that is in their actively managed funds in month t scaled by its sample standard deviation, $BigThree_f$ is a dummy variable of 1 if fund family f is one of The Big Three and 0 otherwise, $Inv_{f,i,t}$ is the ratio of a fund family's overall holdings (i.e., the sum of active and passive holdings) in a stock to TNA of the fund family's overall portfolio scaled by its sample standard deviation, $\gamma_{f,t}$ represents fund family-month fixed effects, and δ_p represents proposal fixed effects. The voting and holdings data come from ISS and the CRSP Mutual Fund Holdings Database, respectively, and we match them. The model is estimated over the 2008–2018 period. Standard errors are clustered at the fund family level and reported in parentheses. The symbols ** and *** indicate significance at the 5% and 1% levels, respectively.

Dependent variable =	$Attention_{f,i,p,t}$									
	(1)		(2)		(3)		(4)		(5)	
$ActiveTilt_{f,i,t}$	0.0118**	0.0115**	0.0118**	0.0116**	0.0118**	0.0116**	0.0118**	0.0115**	0.0118**	0.0115**
	(0.00557)	(0.00575)	(0.00560)	(0.00578)	(0.00560)	(0.00578)	(0.00559)	(0.00577)	(0.00559)	(0.00577)
$ActiveTilt_{f,i,t} \times BigThree_f$		0.00858		0.00829		0.00830		0.00871		0.00872
		(0.0120)		(0.0117)		(0.0117)		(0.0118)		(0.0118)
$Inv_{f,i,t}$	0.00850**	0.00854**	0.00843**	0.00847**	0.00846**	0.00850**	0.00851**	0.00855**	0.00853**	0.00857**
	(0.00397)	(0.00397)	(0.00397)	(0.00397)	(0.00397)	(0.00397)	(0.00397)	(0.00397)	(0.00397)	(0.00397)
$Inv_{f,i,t} \times BigThree_f$	0.0522***	0.0520***	0.0523***	0.0520***	0.0521***	0.0518***	0.0522***	0.0519***	0.0520***	0.0518***
	(0.0121)	(0.0115)	(0.0120)	(0.0115)	(0.0120)	(0.0114)	(0.0121)	(0.0115)	(0.0121)	(0.0115)
Fund family-month fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Proposal fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	270,282	270,282	269,485	269,485	269,485	269,485	270,282	270,282	270,282	270,282
R-squared	0.562	0.562	0.562	0.562	0.562	0.562	0.562	0.562	0.562	0.562

Table 9

Robustness of Findings to Two-Way Clustering
(Based on contentious shareholder proposals)

This table repeats the analysis of Table 4, clustering standard errors by fund family (single clustering in column 2 and 3) and by fund family and proposal (double clustering in column 4 and 5). Specifically, we estimate

$$Attention_{f,i,p,t} = \beta\{ActiveTilt_{f,i,t}, ActiveTilt_{f,i,t} \times The\ Big\ Three_f, Inv_{f,i,t}, Inv_{f,i,t} \times The\ Big\ Three_f\} + \gamma_{f,t} + \delta_p + \varepsilon_{f,i,p,t},$$

where $Attention_{f,i,p,t}$ is the proportion of fund family f's votes on firm i's proposal p in month t which deviated from the recommendation of ISS, $ActiveTilt_{f,i,t}$ is the proportion of fund family f's holdings in stock i that is in their actively managed funds in month t scaled by its sample standard deviation, $The\ Big\ Three_f$ is a dummy variable of 1 if fund family f is one of The Big Three and 0 otherwise, $Inv_{f,i,t}$ is the ratio of a fund family's overall holdings (i.e., the sum of active and passive holdings) in a stock to TNA of the fund family's overall portfolio scaled by its sample standard deviation, $\gamma_{f,t}$ represents fund family-month fixed effects, and δ_p represents proposal fixed effects. The voting and holdings data come from ISS and the CRSP Mutual Fund Holdings Database, respectively, and we match them. The model is estimated over the 2008–2018 period. The sample excludes observations where mutual fund family's ownership in a stock is negative. Standard errors are reported in parentheses. The symbols ** and *** indicate significance at the 5% and 1% levels, respectively.

Dependent variable =	$Attention_{f,i,p,t}$			
	Single cluster		Double cluster	
$ActiveTilt_{f,i,t}$	0.0118**	0.0116**	0.0118**	0.0116**
	(0.00560)	(0.00578)	(0.00558)	(0.00575)
$ActiveTilt_{f,i,t} \times BigThree_f$		0.00829		0.00829
		(0.0117)		(0.0116)
$Inv_{f,i,t}$	0.00843**	0.00847**	0.00843**	0.00847**
	(0.00397)	(0.00397)	(0.00394)	(0.00394)
$Inv_{f,i,t} \times BigThree_f$	0.0523***	0.0520***	0.0523***	0.0520***
	(0.0120)	(0.0115)	(0.0121)	(0.0116)
Fund family-month fixed effects	yes	yes	yes	yes
Proposal fixed effects	yes	yes	yes	yes
Observations	269,485	269,485	269,485	269,485
R-squared	0.562	0.562	0.562	0.562
Double cluster by fund family and proposal	no	no	yes	yes

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RESEARCH IN PROGRESS

August 2023	Is the Tail Wagging the Dog? Active Holdings and Passive Investors' Attention, with Ian Appel, Todd Gormley, Don Keim, and Chaehee Shin

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