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ESSAYS ON SHAREHOLDER ENGAGEMENT AND VOTING

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Contents

Introduction

Institutional investors have the obligation and right to govern portfolio companies.[1] At the broadest level, governance mechanisms can be classified under three categories: trading ("governance via exit"), engagement and voting ("governance via voice"), and takeovers. Specifically, engagement and voting encompasses behind-the-scenes engagement, activist campaigns, shareholder proposals, voting on proposals, and proxy fights (Dasgupta et al., 2021). This thesis consists of three self-contained empirical papers on the topic of shareholder engagement and voting.

Voting at shareholder meetings is in essence an aggregation of dispersed information in the financial market (Malenko, 2023). Institutional investors possess different means of information acquisition depending on the company in question, which leads to substantial heterogeneity of voting decisions across firms. For example, investors become informed prior to voting by communicating with company management through business ties (Cvijanovic et al., 2016), board connections (Calluzzo and Kedia, 2019), and educational network (Butler and Gurun, 2012). In Paper 1, I propose that geographic distance also affects the dissemination of proxy information, thus resulting in a "home bias" in shareholder voting.

Proxy advisory firms that sell research and voting recommendations to investors act as important information intermediaries. From the perspective of institutional investors, the cost of purchasing proxy advisor services is arguably much lower than the costs of performing independent research on each individual proposal for hundreds or even thousands of firms in their portfolios within a short period of time, especially if the investor invests internationally. As a result, institutional investors routinely consult proxy advisors to reduce voting costs and acquire proxy research advice (McCahery et al., 2016). In recent years, the proxy advisory industry has received growing scrutiny from regulator and academics due to its high industry concentration, persistent influence on voting outcomes, and "one-size-fits-all" approach (see, e.g.,

[1] Institutional investors mainly refer to pension funds, mutual funds, insurance companies, endowments, and hedge funds.

Larcker et al., 2015; Malenko and Malenko, 2019; Albuquerque et al., 2020; Matsusaka and Shu, 2023; Malenko et al., 2023).

Shareholder voting can also be viewed as an aggregation of shareholders' heterogeneous preferences and views. In other words, voting behavior exhibits large heterogeneity amongst institutional investors. Apart from ideological differences (Bolton et al., 2020; Bubb and Catan, 2021), the costs and benefits associated with voting also varies greatly across investors (Iliev and Lowry, 2014; Lowry et al., 2022). Another important source of heterogeneity across institutional investors relates to whether they are active or passive investors (see, e.g., Brav et al., 2022; Corum et al., 2022; Heath et al., 2022; Hshieh et al., 2021).

Mutual fund as a specific type of institutional investor is of particular interest in the context of shareholder voting because of its dual-layered agency structure. As equity holders of portfolio companies, mutual funds act as principals who monitor their agents (corporate executives); meanwhile mutual funds are also agents who vote on behalf of their clients. The incentive structure arising from the agency relationship between mutual funds and their own beneficial investors determines how fund managers allocate resources in monitoring portfolio companies (Bebchuk et al., 2017). For asset management firms, the incentives to engage stem from management fees and fund flows (Lewellen and Lewellen, 2022). Value created through monitoring and voting results in higher stock returns and correspondingly an increase in the fund's assets under management (AUM) and management fees ("direct incentives"). By engaging with a portfolio company and increasing its value, the fund also generates a proportional gain in benchmark-adjusted return. This improved relative performance attracts fund inflows, which allows the fund to collect additional management fees ("indirect incentives").[2] Since the improvement in relative performance is proportional to the difference between the company's portfolio weight and benchmark weight, indirect incentives depend on whether the fund under- or overweights a firm relative to the benchmark. In Paper 2, we test this incentives framework by empirically showing that mutual funds' decision to vote actively can be partially explained by the magnitude and direction of active weights (deviation of portfolio weight from benchmark weight). Our finding not only lends empirical support to the theoretical predictions about the agency problem in mutual fund voting, but also leaves an intriguing question for future research, namely how to better align mutual funds' incentives to engage with their fiduciary duties.

In light of the considerable attention given to shareholder engagement in and outside academia,

[2]The realization of indirect incentives also depends on flow-to-performance sensitivity and whether fund investors attribute overperformance to the fund manager's stock selection skills or engagement efforts (Brav et al., 2022).

a critical question emerges: what impact does shareholder engagement have on corporate governance and beyond? A proliferation of studies have been devoted to this question (for a comprehensive review, see Dasgupta et al., 2021, Chapter 5). In particular, a new research topic revolves around the integration of shareholder engagement within the framework of environmental, social, and governance (ESG) investment strategies and its implications. Empirical research on this topic typically examines engagement by a particular investor (see, e.g., Dimson et al., 2015; Barko et al., 2021; Naaraayanan et al., 2021; Hoepner et al., 2021; Bauer et al., 2022b) or shareholder proposals (see, e.g., Grewal et al., 2016; Flammer et al., 2021; Bauer et al., 2022a). Evidence so far is rather mixed, which calls for more research. Paper 3 contributes to this topic by investigating the effect of environmental shareholder proposals on fostering corporate green innovation. Our study adds new evidence to the discussion on the "real impact" of shareholder engagement which has significant ramifications for current regulations and industry practices.

Given the complexities involved in shareholder engagement as briefly summarized above, this thesis aims to shed light on some of these issues by studying how institutional investors use shareholder engagement and voting as a tool to influence their investees. The following paragraphs present a concise outline of the three papers.

Paper 1. Home bias in shareholder voting

The first paper is contextualized amidst the costs of shareholder voting. Specifically, for international investors, the costs of voting domestic firms are lower than voting foreign firms. These costs include costs of acquiring relevant information and direct costs of voting such as legal costs and time spent on communication. Using a high-dimensional fixed effects model, I show that investors are more likely to vote with management at domestic firms than at foreign firms, especially when ISS disagrees with management. I further demonstrate that the home bias can be explained by local investors' information advantage and favoritism for domestic firms. Overall, this paper documents the important role of geographic distance in voting behavior among institutional investors worldwide.

Paper 2. Two-Dimensional Activeness: Exploring the Interplay Between Active Ownership and Active Portfolio Management

with Trond Døskeland, André Wattø Sjuve and Andreas Ørpetveit

The second paper is positioned around the benefits of shareholder voting. We examine mutual funds' voting strategies against the backdrop of a relative performance-based incentive framework. We find that, consistent with indirect incentives of shareholder engagement, mutual funds are more likely to vote actively at companies whose portfolio weights deviate from the benchmark weights, especially when the company is overweighted by the fund manager. Our results suggest that fund managers' monitoring efforts are primarily directed to a small fraction of portfolio companies which they picked as best bets.

Paper 3. Shareholder activism and the green transition

with Geir Drage Berentsen, Håkon Otneim, and Steffen Juranek

The third paper concerns the impacts of shareholder engagement. We ask the question of whether shareholder proposals could help address real-world challenges such as climate change. Combining matching with a difference-in-differences design, we find a decrease in corporate green innovation subsequent to shareholder activism. We also support our findings with a an instrumental variable approach. The results hold regardless of whether the proposals are environmentally material or whether the proposals are filed by institutional investors. Our findings reflect the limitations of shareholder proposals given the present regulatory requirements.

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Home bias in shareholder voting

Xuan Li

Abstract

Institutional investors' proxy voting decisions are influenced by their geographic proximity to portfolio firms. Using a sample of over 50 million votes cast by U.S. and non-U.S. investors globally, I find that investors are more likely to vote with management at domestic firms compared to foreign firms, especially when ISS disagrees with management. I further demonstrate that the home bias can be explained by local investors' information advantage and favoritism towards domestic firms. These results suggest that home bias is an important determinant of proxy voting behavior, and the existence of home bias is at least partially driven by rationality-based reasons.

Keywords: Home bias; Geographic proximity; Proxy voting; Corporate governance
JEL Classification G15; G30; G34

1.1 Introduction

Geographic proximity between institutional investors and portfolio firms affects governance activities. On the one hand, local investors have lower costs for gathering and accessing firm-level information, and firms with higher local ownership has been found to be associated with better corporate governance (Gaspar and Massa, 2007; Chhaochharia et al., 2012). In contrast, foreign investors engage less in governance activities due to information asymmetry (Kang and Kim, 2010). On the other hand, domestic investors are more likely to have business relations with local companies, whereas foreign investors tend to be more independent and therefore can act as more effective monitors. Along this line of argument, Ferreira and Matos (2008) find a positive relationship between foreign ownership and firm valuation and operating performance. Moreover, foreign investors have a more important role to play in countries with weak shareholder protection (Aggarwal et al., 2011).

Despite the fact that proxy voting is an effective corporate governance mechanism for exercising shareholder rights around the world (Iliev et al., 2015), the role of geographic proximity in shareholder voting is much less understood, especially on a global scale. Previous studies have found that the geographic proximity of institutional investors could facilitate information exchange and coordinated voting (Iliev and Lowry, 2014; Huang and Kang, 2017; Huang, 2023). In addition, Das (2011) examines the geographic proximity between fund managers and portfolio firms within the border of the U.S. and finds that fund managers vote more in favor of management in locally headquartered firms. However, the voting patterns of domestic investors versus foreign investors is still unclear.

In this study, I examine the relationship between geographic proximity and shareholders' voting decisions. First, I test whether institutional investors are more likely to vote for management at firms that are located in the same country or same continent, and that share a common language. Second, I explore the case of environmental, social and governance (ESG) home bias in the context of shareholder voting. Lastly, I investigate possible explanations for the presence of home bias in shareholder voting.

I use the Investor Voting database from Insightia (formerly known as Proxy Insights) that comprises over 50 million votes cast in 2012 to 2022 by 1,336 institutional investors from 24 countries on 15,713 companies located in 59 different countries. The unit of observation is on the investor-firm-year-proposal level. The granularity of the data allows me to exploit a high-dimensional fixed effects model that controls for time-varying unobserved heterogeneity on

investors, firms, and proposals.

I find that investors are on average 4.6% more likely to vote with management at domestic firms in comparison to foreign firms across all proposals. This result is obtained after controlling for ISS recommendation, country weight in the voting portfolio, investor × year fixed effects, firm × year fixed effects, and even proposal fixed effects, thereby eliminating omitted variable bias at various levels. The effect of geographic proximity is almost two times larger than the effect of shared racial/ethnic identity (Sulaeman and Ye, 2023).

I also show an incremental effect of geographic proximity on promanagement voting for environmental & social (E&S) proposals relative to governance proposals, which means that investors are more lenient on E&S issues towards managers at home, while punishing managers abroad for the same issues. This result stands in sharp contrast with a prior study by Groen-Xu and Zeume (2021). My results suggest that investors are likely to choose the benefits of geographic proximity over altruistic motives when exercising their voting rights.

Once I confirm the existence of home bias in shareholder voting, I turn to the second research question: What is the mechanism that drives home bias in shareholder voting? I propose two potential, non-mutually exclusive channels that are consistent with the home bias phenomenon, namely information advantage and favoritism.

First, local investors may possess an information advantage in proxy research that enables them to cast more informed votes. In general, local investors are likely to have lower communication costs, lower information gathering costs, and easier access to private information (Chhaochharia et al., 2012; Lee, 2023). When it comes to director elections, which account for nearly three quarters of all proposals at annual meetings, local investors may have access to more "soft" information about the director nominees through a shared social network (Butler and Gurun, 2012) and board connections (Calluzzo and Kedia, 2019). These information allows local investors to acquire private signals about the true quality of the candidates, and voting with management may simply be the best strategy to maximize shareholder value in these cases.

To find out how investors acquire information and conduct proxy research for domestic and foreign firms prior to voting, I hand collect the voting policies of institutional investors in my sample from their websites and SEC filings. In a qualitative analysis, I find that investors address the geographic heterogeneity of corporate governance and voting practices through various means. Large investors tend to adopt multiple voting policies for different regions, and many investors follow separate engagement and voting processes for domestic and foreign holdings. For example, some non-U.S. investors obtain additional proxy research for domestic

firms from local proxy advisors that only operate within a certain market, or conduct in-house proxy research for domestic firms while outsourcing foreign votes to external proxy advisors.

If there is indeed an information advantage for local investors, this advantage should be particularly pronounced when there is greater information asymmetry. I conduct heterogeneity tests with regards to the degree of opaqueness at the country level. I use several proxies for information asymmetry, and find that the home bias is intensified when the firms are located in non-English speaking countries, in countries with less financial disclosure or governance transparency, and in countries with earlier cutoff dates for registering votes before the shareholder meeting.

Second, investors are susceptible to favoritism and behavioral biases. In particular, investors are likely to be more exposed to more news about local firms and be more familiar with local firms, which could lead investors to favor local firms when casting votes. Moreover, investors are more likely to have business ties with local firms, such as managing pension plans for local firms. This constitutes a conflict of interest and could influence local investors' voting behavior in two different ways. On the one hand, investors may avoid disagreeing with managers in public for fear of losing lucrative businesses from local firms. Instead they may prefer quiet agreement on governance changes through private communication with connected firms. On the other hand, firm managers have incentives to solicit support from these local investors to pursue private interests, representing a type of demand-driven promanagement voting (Cvijanovic et al., 2016).

I expect promanagement voting at domestic firms to increase when there is less protection for foreign investors who are more likely to be independent, if such behavior is driven by favoritism. In line with this hypothesis, I find that local investors agree more with managers in countries where the legal system encourages self-dealing and favors managers or dominant shareholders, and where the corruption level is high.

Lastly, since information advantage and favoritism have very different implications for regulations, I investigate which one is the dominant channel for home bias. In the the context of consensus proposals, information advantage would take the form of a greater tendency for local investors to vote against conventional wisdom, whereas favoritism implies always voting with management. I find that when ISS recommends voting for management or when there is a high support rate for management among other shareholders, investors are more likely to oppose management at domestic firms than at foreign firms. Moreover, informed voting requires assessing each portfolio firm separately, whereas favoritism encourages a one-size-fits-all voting strategy. The results show that investors are less likely to vote in a one-size-fits-all manner

for domestic holdings. These findings are more consistent with information advantage than favoritism in explaining the home bias.

In short, my results suggest that both information asymmetry and favoritism could at least partially explain the existence of home bias in shareholder voting, and information advantage seems to be the dominant channel.

My findings relate to two strands of the literature. This paper adds to the literature on home bias in the financial market. It is among the first to document a sizeable home bias in shareholder voting. In particular, I extend the research of Chhaochharia et al. (2012) and Kim et al. (2016) on the influence of geographic proximity on governance outcomes to proxy voting, a key component of the corporate governance process. Additionally, I construct a series of tests to identify whether the home bias in shareholder voting is driven by information asymmetry or favoritism.

I also contribute to the growing literature on shareholder voting by broadening the geographic coverage of this literature to institutional investors around the world. As noted by Iliev et al. (2015), an ideal dataset to study shareholder voting patterns globally would consist of the votes cast by all shareholders domiciled in all countries. However, this has not been possible due to minimal regulatory requirement outside the U.S. As a result of limited data availability, previous studies tend to focus only on the U.S. market (i.e., votes cast by U.S. investors in domestic and foreign companies), leaving a research gap for an international review. This study bridges this gap in the shareholder voting literature by expanding the research scope to non-U.S. investors. The adoption of an international perspective is crucial in the context of shareholder voting for two reasons. First, there are considerable operational challenges and information barriers associated with voting by proxy at foreign companies (NBIM, 2020). The high degree of disparity between markets has largely been overlooked in the extant literature. Second, country characteristics are important determinants of governance activities (Doidge et al., 2007), and it may not be entirely justifiable to generalize findings in the U.S. to other markets in this setting. This study builds on Iliev et al. (2015) which discusses the effectiveness of the voting mechanism for exercising governance around the world, but differs by highlighting a specific type of inefficiency in monitoring portfolio companies globally.

1.2 Background and motivation

Home bias is a well-documented phenomenon in finance. Investors allocate a disproportionately large fraction of their investment portfolios to domestic equity, even though the legal and technological barriers of investing internationally have essentially diminished in the 21st century. The early work by French and Poterba (1991) and Tesar and Werner (1995) reveals investors' strong preference for domestic equity despite the benefits of international diversification. Not only are retail investors subject to home bias, but also institutional investors such as mutual fund managers (Chan et al., 2005). The home bias also extends to domestic portfolios where firms within shorter distance (such as in the same state) are disproportionately overweighted (Grinblatt and Keloharju, 2001; Ivković and Weisbenner, 2005; Pool et al., 2012). Home bias also exists among information intermediaries. For instance, equity analysts make more precise earnings forecasts for domestic firms and geographically proximate firms (Malloy, 2005; Bae et al., 2008; Du et al., 2017). Local analyst recommendations are also more optimistic than foreign analyst recommendations in emerging markets (Lai and Teo, 2008). Similarly, credit analysts award more favorable ratings to issuers from their home states than to issuers from other states (Cornaggia et al., 2020). However, to the best of my knowledge, no previous studies have explored the implications of home bias in the context of shareholder voting.

Shareholder voting as a key monitoring mechanism expresses the views and values of investors worldwide. Investors' strong preference for domestic equities is likely to be reflected in the votes they cast. If so, we can expect to see a home bias in shareholder voting. I develop two possible explanations to account for this home bias: information advantage and favoritism.

Prior to voting at company annual meetings, investors gather information about portfolio firms through various channels including hiring proxy advisors and conducting independent research (Iliev and Lowry, 2014; Malenko and Shen, 2016; Malenko and Malenko, 2019; Matsusaka and Shu, 2021). Importantly, investors can obtain unique information that may not be accessible for other investors through their relationships with portfolio companies such as business ties (Davis and Kim, 2007; Cvijanovic et al., 2016) and board connections (Calluzzo and Kedia, 2019). Furthermore, geographic proximity between investors and portfolio companies could also facilitate efficient information transfers (Coval and Moskowitz, 1999; Baik et al., 2010). Geographic proximity provides local investors with easier access to in-person conversations with employees, managers, suppliers, and customers of local firms, as well as lower costs of visiting company facilities on the spot, which constitutes valuable private information. Local investors

may obtain unique information about the firm through local media. This information advantage could lead domestic investors to arrive at voting decisions that differ from foreign investors.

Local investors may also choose to maximize the information advantage by actively seeking out more information about local firms (i.e., information specialisation). Since local investors possess more accurate information about the home asset's payoff, local investors could use that information to trade accordingly and generate excess return. By that logic, investors should specialize in research on home assets given limited capacity, which in turn leads to higher excess return (Van Nieuwerburgh and Veldkamp, 2009). In line with this theoretical prediction, Dyer (2021) provides empirical evidence that investors actively demand more public information on local assets. Schumacher (2017) documents that, consistent with the specialized learning explanation, international mutual funds overweight industries that are relatively large in their domestic stock market in their foreign portfolios, but underweight large domestic industries at home.

If information asymmetry could at least partially explain the existence of home bias, one would expect local investors to generate better performance relative to nonlocal investors. Existing evidence on this topic is mixed. Ivković and Weisbenner (2005) find that individual investors not only exhibit a strong preference for local investments, but also generate excess returns from their local holdings relative to their nonlocal holdings. Ferreira et al. (2017) find that local institutional investors show better performance when they possess a domestic information advantage (outside the United States and in countries where the official language is not English). However, Seasholes and Zhu (2010) and Pool et al. (2012) find opposite results, concluding that local holdings do not generate abnormal performance. It appears that information-based explanations alone cannot fully explain the persistence of home bias. Therefore, I propose another source of home bias, i.e., favoritism.

Shareholder voting is fraught with different types of favoritism. When voting on director nominees, fund managers prefer candidates with similar demographics including gender and ethnicity. Di Giuli et al. (2022b) find that female fund managers are more likely to support female director nominees. Similarly, Sulaeman and Ye (2023) find that fund managers have a higher propensity of voting for director nominees of the same racial/ethnic identity. Such in-group favoritism extends beyond demographic characteristics. Business ties can facilitate information exchange, but can also be channels for inefficient favoritism (Kuhnen, 2009; Fracassi and Tate, 2012). For example, Butler and Gurun (2012) show that fund managers who are in the same educational network as company CEOs are more likely to vote against shareholder

proposals that aim at limiting executive compensation. When the investor and its portfolio firm are located in the same country, it is more common for investors to form business ties and social connections with the firm. Firm managers could demand quid pro quo votes from connected investors, which induces promanagement voting (Cvijanovic et al., 2016; Calluzzo and Kedia, 2019). Thus, such connections create a conflict of interests that impedes investors' abilities to govern portfolio firms efficiently.

The existence of favoritism can also be rooted in behavioral biases such as familiarity bias and salience bias. Common language, similar culture, and short distance could all contribute to familiarity bias (Grinblatt and Keloharju, 2001). Investors receive more exposure to local news media of local firms, which naturally leads to increased salience (Dyer, 2021). While it is a well-known fact that mutual fund managers are subject to behavioral biases, recent studies have demonstrated that such biases are also present in mutual fund voting. For example, Foroughi et al. (2022) find that fund managers located in more polluting countries vote more in favor of environmental proposals. Similarly, Di Giuli et al. (2022a) show that fund managers exposed to abnormally hot temperatures are more likely to support environmental proposals.

1.3 Data and empirical design

1.3.1 Sample construction

I use a novel dataset from Insightia (formerly known as Proxy Insights) that compiles the votes cast by global institutional investors on proposals for companies around the world.[1] While not all markets are covered, to my knowledge it provides by far the most comprehensive data on voting records of non-U.S. investors. I include the votes cast by banks, fund managers and investment firms in my analysis.[2] This encompasses proxies voted on behalf of pooled investment funds, exchange traded funds (ETFs), and certain separately managed accounts. Apart from voting information (e.g., vote cast, voting outcome, ISS & Glass Lewis recommendations, proposal content), the dataset also contains basic information about the companies including company name, location of headquarter and industry sector, as well as about the investors including

[1] According to Insightia, the data is sourced from disclosures to market regulators, investors' and companies' own websites, Freedom of Information Act requests, and direct communication with investors.

[2] The Insightia investor voting database also comprises the votes cast by other types of investors such as labor union and pension funds that make up a small fraction of the database. I do not include these investors in my sample for the sake of comparability, as these investors may have other incentives to vote differently (e.g., Duan et al. (2021)). Also, voting data on these investors are mostly confined to the U.S., which does not add much value to the analysis.

investor name and asset under management (AUM). Additionally, I obtain information on investor domicile from Orbis by manually matching investor names and cross check the data from Orbis with information on the investor's own website. Countries with less than 5000 votes and investors with less than 500 votes over the sample period are excluded. Occasionally when an investor manages multiple client accounts or mutual funds that hold securities of the same issuer, the investor may vote differently on the same matter depending on the account or fund managed. To avoid inconsistency, I also exclude these contradictory votes. Lastly, I exclude companies and investors headquartered in Bermuda because the choice of headquarter is likely due to tax reasons and does not reflect the location of the company's real operations.

The final sample contains 54.5 million distinct votes that are cast on 15,713 firms headquartered in 59 countries by 1,336 institutional investors in the period between 2012 and 2022. Table 1.1 exhibits the geographic distribution of institutional investors and corporations in the final sample.

Table 1.1 shows that there is considerable variation across countries in the number of firms in my sample, ranging from two in Georgia to 5,533 in the U.S. It's worth noting that my sample covers a significant number of firms in non-English speaking countries as well as in emerging markets. The diversity of geographic distribution facilitates a comprehensive comparison of investor voting globally. The number of investors by country also varies substantially. While the majority of investors that disclose their voting records are domiciled in the U.S., many investors located in countries where there is no regulatory disclosure requirement also choose to make their votes publicly accessible, presumably for marketing or reputational purposes. Despite the concentration of investor domicile, the number of votes cast is geographically more evenly distributed in comparison.

Table 1.2 presents summary statistics on the voting portfolio on the investor-year level. I summarize all the votes cast by each investor on a yearly basis and name it the investor's voting portfolio. On average, an investor votes in nearly 14 different countries in a given year, which underscores the global nature of shareholder voting. The number of firms in an investor's voting portfolio varies from one to 8,251, while the number of votes falls in the range of one to 92,306.

Table 1.1. Sample distribution by country

Country/region	County ISO code	No. of companies	No. of votes	No. of investors
US	US	5,533	23,777,953	933
Japan	JP	1,460	5,975,090	49
UK	GB	589	4,151,493	80
China	CN	1,162	2,737,433	0
France	FR	202	1,973,278	14
Canada	CA	553	1,839,412	98
Switzerland	CH	153	1,399,176	16
Sweden	SE	172	975,498	3
Hong Kong	HK	417	965,436	4
Germany	DE	224	899,376	7
India	IN	597	781,658	35
South Africa	ZA	153	731,445	18
Australia	AU	368	634,654	32
Netherlands	NL	115	623,684	15
Ireland	IE	72	620,845	3
Taiwan	TW	686	608,271	0
South Korea	KR	731	591,385	4
Spain	ES	91	523,849	0
Brazil	BR	226	352,152	2
Denmark	DK	52	324,325	3
Singapore	SG	149	294,490	1
Poland	PL	79	277,104	0
Mexico	MX	93	271,315	0
Russian Federation	RU	62	269,723	0
Belgium	BE	62	242,439	0
Malaysia	MY	246	236,658	0
Thailand	TH	163	234,344	5
Italy	IT	145	232,868	2
Finland	FI	60	231,007	4
Philippines	PH	79	206,448	0
Turkey	TR	109	192,273	0
Norway	NO	51	174,667	5
Israel	IL	121	167,211	0
Luxembourg	LU	44	151,493	2
Indonesia	ID	162	127,248	0
Chile	CL	65	103,120	0
Austria	AT	39	91,221	1
Saudi Arabia	SA	42	68,838	0
Greece	GR	43	66,125	0
United Arab Emirates	AE	32	54,885	0
Portugal	PT	18	43,912	0
New Zealand	NZ	43	35,484	0
Colombia	CO	22	34,347	0
Argentina	AR	20	31,031	0
Puerto Rico	PR	6	27,296	0
Cyprus	CY	12	20,732	0
Hungary	HU	6	20,617	0
Czech Republic	CZ	7	19,751	0
Vietnam	VN	36	13,618	0
Romania	RO	9	10,955	0
Pakistan	PK	40	10,171	0
Egypt	EG	9	9,005	0
Mauritius	MU	8	7,303	0
Monaco	MC	8	7,186	0
Peru	PE	13	5,872	0
Nigeria	NG	23	5,752	0
Malta	MT	4	5,503	0
Georgia	GE	2	5,186	0
Kuwait	KW	25	5,003	0
All		15,713	54,498,614	1,336

Table 1.2. Summary statistics for investors' voting portfolio

This table presents summary statistics on the voting portfolio on the investor-year level. The voting portfolio is defined as all the votes cast by an investor on a yearly basis. N refers to the number of voting portfolios on the investor-year level. No. of countries refers to the number of countries where the firms in a voting portfolio are headquartered. No. of firms refers to the number of firms in a voting portfolio. No. of votes refers to the total number of votes cast by an investor in a voting portfolio.

	N	Mean	St. Dev.	Min	P25	Median	P75	Max
No. of countries	11,075	14	15	1	3	7	21	58
No. of firms	11,075	440	1,012	1	33	88	302	8,251
No. of votes	11,075	4,921	11,207	1	352	947	3,470	92,306

1.3.2 Descriptive statistics

I start by conducting a univariate analysis of investors' voting patterns for domestic and foreign firms. In Table 1.3, the first row shows the distribution of investors votes for the full sample. Unconditionally, investors vote with management 91.04% of the time at home compared to 86.36% of the time abroad (i.e., 4.68% difference). A two-proportions z-test confirms that the difference is statistically significant at the 1% level. Previous studies have found that investors tend to devote more resources to proxy research when ISS recommendation disagrees with management recommendation (Iliev and Lowry, 2014; Heath et al., 2022; Sulaeman and Ye, 2023), so I split the sample into consensus items (rows 2 and 3) and contentious items (rows 4 and 5) separately. It is worth noting that the home bias is more pronounced for contentious votes. Even though the overall promanagement level is lower for contentious votes, which is unsurprising given the powerful influence of ISS, the difference of the support rate for management between domestic firms and foreign firms is much larger (18.61% for items where management recommends yes and ISS recommends no, and 19.37% for items where management recommends no and ISS recommends yes). Overall, I find that the support rate for management is consistently higher in domestic firms relative to foreign firms, which suggests a strong home bias in shareholder voting.

Table 1.3 presents the difference in promanagement votes for domestic and foreign firms among all pooled votes. A potential caveat is that the results could be driven by a few large investors who cast the majority of votes globally, or by peculiar patterns in a given year. To rule out this possibility, I use an investor-level metric of abnormal support rate of management

Table 1.3. Investor voting on domestic versus foreign firms

With (%) indicates the percentage of votes with management, whereas Against (%) indicates the percentage of votes against management. Abstain and withhold are categorized under Against for the sake of simplicity. A firm is classified as domestic when it is domiciled in the same country as the investor who casts the vote, and foreign when domiciled in a different country. Consensus items refer to proposals where ISS recommendation is the same as management recommendation, while contentious items refer to proposals where ISS recommendation disagrees with management recommendation.

		Domestic firms			Foreign firms			
Mgmt. rec	ISS rec	With (%)	Against (%)	N	With (%)	Against (%)	N	p-value
All		91.04	8.96	22,656,367	86.36	13.64	31,842,247	(0.00)
Consensus								
Yes	Yes	95.37	4.63	20,695,754	92.48	7.52	28,897,656	(0.00)
No	No	90.23	9.77	227,517	89.34	10.66	219,501	(0.00)
Contentious								
Yes	No	39.95	60.05	1,255,721	21.34	78.66	2,544,634	(0.00)
No	Yes	38.24	61.76	477,375	18.87	81.13	180,456	(0.00)

following Sulaeman and Ye (2023). Specifically, the investor abnormal support rate is defined as

$$\begin{aligned}\text{Abnormal Support}_{i,t}(A_i) =& \frac{\sum_{j\in A_i}\sum_p \text{Vote with Management}_{i,j,p,t}}{N_{i,t}(A_i)} \\ &- \frac{\sum_j \sum_p \text{Vote with Management}_{i,j,p,t}}{N_{i,t}(A_i) + N_{i,t}(A_i^C)},\end{aligned} \tag{1.1}$$

for some set A_i and its complement A_i^C, where i, j, p and t denote investor, firm, proposal, and year, respectively. $\text{Vote with Management}_{i,j,p,t}$ is a dummy variable set to one if investor i votes with management on proposal p of firm j in year t, and zero otherwise.

Define $D_i = \{j;$ firm j is in the same country as investor $i\}$ and its complement $D_i^C = \{j;$ firm j is not in the same country as investor $i\}$. A_i takes the set of either D_i or D_i^C. Then $N_{i,t}(D_i)$ indicates the total number of votes cast by investor i on domestic firms in year t, and $N_{i,t}(D_i^C)$ indicates the total number of votes cast by investor i on foreign firms in year t. Accordingly, $\text{Abnormal Support}_{i,t}(D_i)$ is investor i's annual support rate of management for domestic firms benchmarked against its unconditional average support rate of management for all firms in year t, and $\text{Abnormal Support}_{i,t}(D_i^C)$ is investor i's annual support rate of management for foreign firms benchmarked against its unconditional average support rate of management for all firms in year t. I then compute the equal-weighted and vote-weighted abnormal support rate

across all investors during the entire sample period.[3]

Figure 1.1 presents the summary statistics on average investor abnormal support of management at domestic and foreign firms. Panel A reports the equal-weighted abnormal support rate at domestic and foreign firms in contentious, consensus, and all agenda items. I find that investors are by 0.91% more likely to vote with management at domestic firms, compared to their own unconditional propensity to vote with management in general, whereas the abnormal support rate for foreign companies is essentially zero. The difference between domestic and foreign abnormal support rates is four times larger in contentious items, which is consistent with the pattern shown in Table 1.3. The promanagement voting gap between domestic and foreign firms is further amplified when I use vote-weighted investor abnormal support rate, as shown in Panel B. Again, these descriptive statistics point towards an extensive home bias in investor voting.

1.3.3 Empirical design

To control for unobserved heterogeneity that could drive the results in the univariate analysis, I employ a high-dimensional fixed effects model in this paper.[4] The research design is specified as follows:

$$\begin{aligned}\text{Vote with management}_{i,j,c,p,t} = \alpha + \beta_1 \text{Local}_{i,j} + \beta_2 \text{ISS recommendation}_{j,p,t} \\ + \beta_3 \text{Country weight}_{i,c,t} + \gamma_{i,t} + \lambda_{j,t} + \epsilon_{i,j,c,p,t}\end{aligned} \tag{1.2}$$

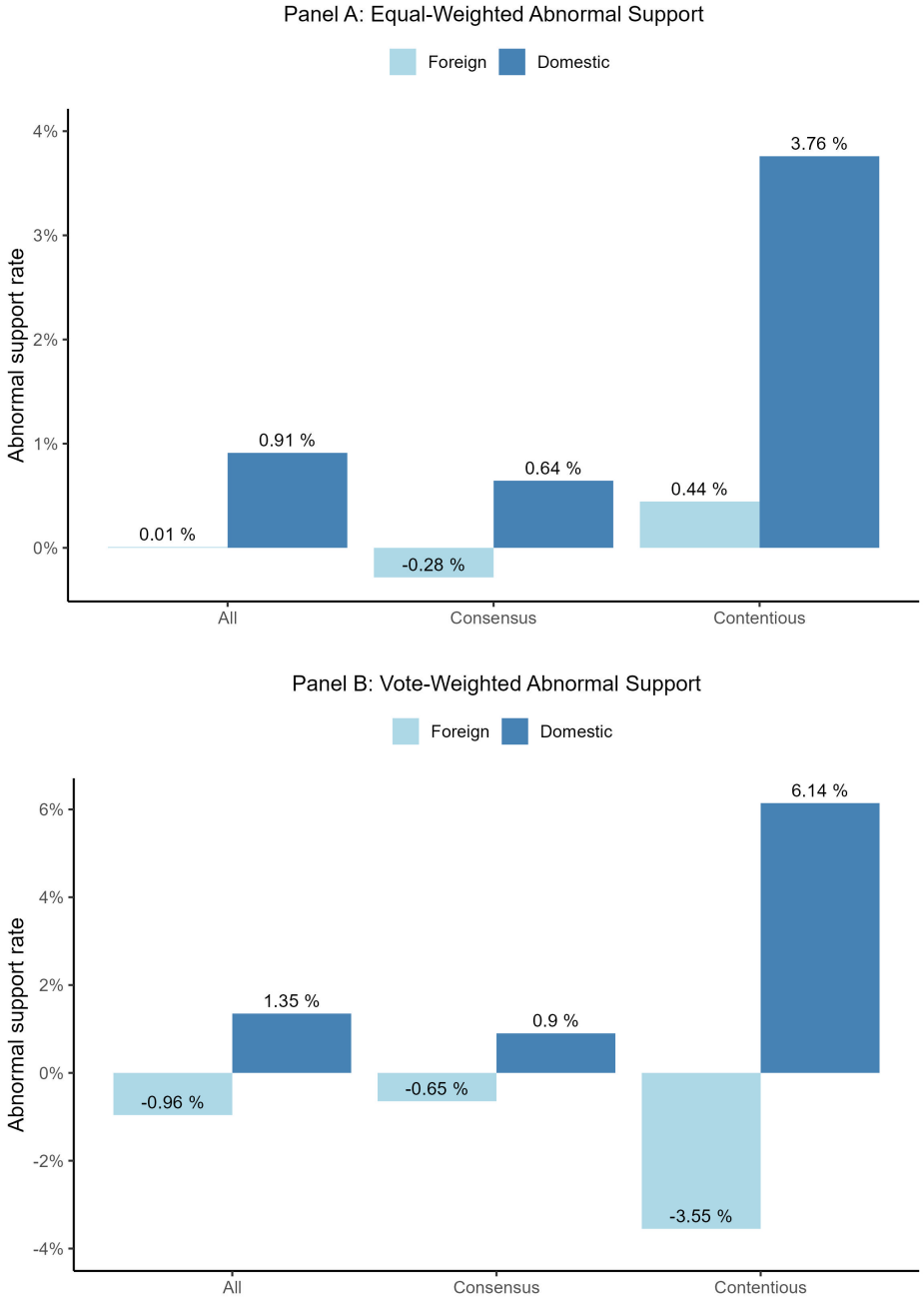
The dependent variable is an indicator variable that equals to one when investor i votes in line with management of company j headquartered in country c on proposal p in year t. The main independent variable is $\text{Local}_{i,j}$, which identifies investor i as a local investor of company j. Throughout my analysis, I use three proxies of local investors: domestic, same continent, and common language. In a recent review, Enriques and Strampelli (2023) point out three main reasons for investors' tendency to engage more actively with domestic companies:

[3]The vote-weighted abnormal support rate is defined as $\frac{\sum_{i,t} N_{i,t}(A_i) * \text{Abnormal Support}_{i,t}(A_i)}{\sum_{i,t} N_{i,t}(A_i)}$ where A_i equals either D_i or D_i^C.

[4]I opt for a linear probability model for two reasons. First, probit/logit models with fixed effects are known to suffer from the incidental parameters problem which leads to biased estimates of the partial effect, while the incidental parameters problem does not arise for the partial effect of interest in a linear probability model (Cameron and Trivedi, 2005). Second, I include interaction effects in several model specifications, and the linear probability model provides a straightforward interpretation of the estimated interaction effects (Greene, 2020). The model is estimated using the "fixest" package in R. For details, please refer to Bergé (2018).

Figure 1.1. Investor Abnormal Support for Managers

This figure plots the average investor abnormal support of management at domestic and foreign firms. Consensus items refer to proposals where ISS recommendation is the same as management recommendation, while contentious items refer to proposal where ISS recommendation disagrees with management recommendation. The light-coloured bar indicates abnormal support rate for foreign firms and the dark-coloured bar indicates abnormal support rate for domestic firms. Abnormal support rate is defined in Equation 1.1.



cultural estrangement, political risks, and marketing needs geared towards domestic clients and beneficiaries. These three metrics allow me to capture the aforementioned aspects in different

ways.

To identify domestic investors, I create a dummy variable that equals one if the country code of the company headquarter is the same as the country code of the investor domicile, and zero otherwise. Being situated in the same country means sharing the same legal system and economic environment, which are important determinants of corporate governance (Doidge et al., 2007). Beyond country border, I also consider the effect of continental influence. Countries of the same continent tend to share similar cultural backgrounds, which could facilitate shareholder engagement. An common barrier that foreign investors face when accessing information overseas is language difference. This is particularly relevant in emerging markets where company disclosure in English is scarce. Thus, common language could be a suitable proxy for information asymmetry. Based on the CIA World Factbook[5], I also create a common language variable that equals one if the country the investor is domiciled in shares a major language with the country the company is headquartered in.

The research design includes two sets of fixed effects: investor×year fixed effects ($\gamma_{i,t}$) and firm×year fixed effects ($\lambda_{j,t}$) and addresses two key endogeneity concerns.[6] First, location is endogenous to country-level socio-economic characteristics that incentivize investors to invest in that country. Second, firm characteristics, such as size and profitability, may jointly affect foreign ownership and governance. For example, investors might have an advantage over selecting domestic firms that are better governed, so there could be systematic differences between domestic and foreign holdings. I address this concern by using firm-year fixed effects and utilizing variation in geographic proximity across institutions within a given firm's shareholder base at a given time. Furthermore, I include investor-year fixed effects which mitigate omitted variable bias at the investor level by controlling for all unobserved investor characteristics that affect its voting across all firms. I also control for ISS recommendations which have a decisive influence over shareholder votes (Malenko and Shen, 2016). To further eliminate the influence of each proposal, I also use proposal fixed effects in certain specifications.[7]

Another concern relates to holding size. The preference for domestic equities in investment portfolios is endogenous to the choice of actively monitoring domestic firms, because a larger holding size entails bigger voting power and bigger influence on investment returns, which

[5]The date is available at `https://www.cia.gov/the-world-factbook/field/languages/` (accessed September 1, 2023).

[6]An ideal setting would be to investigate the change in investors' votes when a firm changes headquarter to a different country, but this approach is not feasible in my study because it is extremely rare that companies relocate across borders.

[7]Proposal fixed effects are based on a unique ID linked to each individual proposal in the Insightia voting database.

justifies devoting more resources to monitor these firms (Iliev and Lowry, 2014). One way of solving the problem is to control for the investor's holding size in each portfolio company directly. Data on portfolio holdings of institutional investors is usually obtained through 13F filings. However, since my sample consists of non-U.S. investors which do not file 13Fs, this approach is not viable. Instead, I compute a country weight variable, which is defined as the number of companies which investor i has voted in country c (where company j is headquartered) as a proportion of the total number of companies investor i has voted in year t. Although this variable is not a perfect proxy for holding size, but it captures to a large extent the investor's magnitude of investment and degree of active monitoring in a country.

1.4 Is there a home bias in shareholder voting?

1.4.1 Main results

In this section, I report the baseline results for whether local investors are more likely to vote with management in the regression framework described above.

Table 1.4 shows the results of estimating the linear probability model specified in Equation (1.2). In Column (1), I find that an investor is 4.6% more likely to vote with management at domestic firms in comparison to foreign firms, after controlling for various time-varying firm characteristics, investor-characteristics and proposal characteristics.[8] The estimated effect is significant both statistically and economically, and it corresponds to 5.2% of the unconditional average propensity to vote with management of 88.3% across all proposals. In Column (2) and (3), I replace *Domestic* with *Same Continent* and *Common Language*, two proxies for geographic and cultural proximity. The results are similar, with a slightly smaller effect of *Same Continent* (4.1%) and a slightly larger effect of *Common Language* (4.9%), relative to the effect of *Domestic*. These results are highly consistent with the result in the univatiate voting statistics (Table 1.3). I include proposal fixed effects in Column (4)-(6) to control for unobserved proposal heterogeneity such as the quality of the proposal. Thus, identification arises from variation across investors of different degrees of geographic proximity that vote a given proposal. The results are unchanged, suggesting that proposal fixed effects do not explain much of the variation in promanagement voting in addition to firm × year fixed effects.[9] The coefficients on *ISS recommendation* and

[8] The results are very similar when standard errors are clustered by fund×year.

[9] I estimate the following equation: Vote with management$_{i,j,c,p,t}$ = $\alpha + \beta_1 \text{Local}_{i,j} + \beta_2 \text{Country weight}_{i,c,t} + \gamma_{i,t} + \lambda_{j,p,t} + \epsilon_{i,j,c,p,t}$. Note that ISS recommendation is subsumed by the proposal fixed effects and thus not included here.

Country weight are positive and highly significant as expected.

Since the voting data of non-U.S. investors largely depends on voluntary disclosure, a potential problem is sample selection bias. It is possible that investors who are better monitors are more likely to disclose their voting records. If so, these investors, compared to investors who are less transparent, are more likely to treat all portfolio firms equally to avoid reputational damages following disclosure. It means that the result documented here represents a lower bound of the home bias in shareholder voting.

Table 1.4. Local investors and voting with management

This table presents the relation between the probability of voting with management and investors' proximity to firms. The unit of observation is i, j, c, p, t representing investor i, firm j in country c, proposal p, and year t. *Vote with management* is a dummy variable that equals one when investor votes with management on a proposal, and zero when investor votes against management. *Domestic* is a dummy variable that equals one if the investor and the company are domiciled in the same country, and zero otherwise. *Same Continent* is a dummy variable that equals one if the investor and the company are located in the same continent, and zero otherwise. *Common Language* is a dummy variable that equals one if the country the investor is domiciled in shares a major language with the country the company is headquartered in. *ISS recommendation* is an indicator for whether ISS recommends voting for management. *Country weight* is the number of companies on which investor i has cast vote(s) in country c (where company j is headquartered) as a proportion of the total number of companies investor i has voted in year t. Standard errors are clustered on the investor × firm level. ***, **, and * denotes significance at 1%, 5%, and 10% levels, respectively.

	All votes					
Vote with management	(1)	(2)	(3)	(4)	(5)	(6)
Domestic	0.046***			0.046***		
	(0.001)			(0.001)		
Same continent		0.041***			0.040***	
		(0.001)			(0.001)	
Common language			0.049***			0.049***
			(0.001)			(0.001)
ISS recommendation	0.649***	0.649***	0.649***			
	(0.001)	(0.001)	(0.001)			
Country weight	0.018***	0.031***	0.067***	0.017***	0.031***	0.066***
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
Investor×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm×Year FE	Yes	Yes	Yes	No	No	No
Proposal FE	No	No	No	Yes	Yes	Yes
Observations	54,498,614	54,498,614	54,498,614	54,498,614	54,498,614	54,498,614
Adjusted R^2	0.419	0.419	0.419	0.461	0.461	0.461

1.4.2 E&S proposals

There is a special type of heterogeneity that could be potentially masked in the baseline results: the distinction between governance proposals and E&S proposals. While the majority of proposals are related to corporate governance issues, E&S proposals are garnering more and more attention in recent years (Michaely et al., 2023; He et al., 2023). E&S issues deserve special

attention because of their unique characteristics. One trait is that E&S proposals often reflect a desire to reduce negative externalities rather than to merely increase shareholder value. Another one is that E&S proposals are characterised by higher level of contentiousness and almost always fail, in comparison to governance proposals.[10]

Considering that proxy voting is one of the most important avenues for investors to express their ESG preferences, I investigate whether the voting home bias is also present for E&S proposals. Groen-Xu and Zeume (2021) find that investors care more about E&S performance in their home country, and if it is true, it is expected that home bias in shareholder voting should be intensified when it comes to E&S proposals. That is to say, there should be more dissent voting on E&S proposals at domestic firms. On the other hand, Boermans and Galema (2023) show that investors actually apply higher E&S standards to foreign companies in their holdings, which suggests more dissent voting abroad than at home. These two opposing views leads two contradictory hypotheses which are equally possible ex ante. To test which of the two hypotheses is supported by my data, I use the following Difference-in-Difference (DiD) specification:

$$\begin{aligned}\text{Vote with management}_{i,j,p,t} = \alpha &+ \beta_1 \text{Local}_{i,j} + \beta_2 \text{Local}_{i,j} \times \text{E\&S Proposal}_{j,p,t} \\ &+ \beta_3 \text{E\&S Proposal}_{j,p,t} + \beta_4 \text{ISS recommendation}_{j,p,t} \\ &+ \gamma_{i,j,t} + \epsilon_{i,j,p,t}\end{aligned} \tag{1.3}$$

In this DiD design, the additional dimension of proposal category allows me to control for more unobserved heterogeneity by including investor×firm×year effects. More importantly, this research design further alleviates concerns about endogeneity related to holding size. Therefore, the estimate of β_3 provides us with the differential effect of home bias between E&S proposals and governance proposals for a given investor×firm pair in a given year.

Table 1.5 presents the regression results. The coefficient on the interaction term, β_2, is positive and significant at the 1% level across all specifications, and robust to the inclusion of proposal fixed effects. The estimates in Column (1) and (4) suggest that an investor voting on a domestic firm becomes approximately 8 percentage points more likely to side with management when the proposal is related to environmental and social issues, relative to governance proposals.

[10] According to my data sample, ISS recommendation and management recommendation differ on approximately 30% of all E&S proposals, while the percentage of disagreement among governance proposals lies below 10%. In general, ISS tends to be more supportive of E&S proposals than management does.

These results imply that investors hold double standards on corporations when it comes to environmental and social issues, depending on their geographic distance with the firm. The negative coefficient on *E&S* is consistent with the high level of contentiousness associated with E&S proposals. The coefficients on measures of geographic proximity are dropped due to collinearity with firm×investor×year fixed effects and hence are not reported.

Table 1.5. Home bias for E&S proposals

This table presents the relation between investors' proximity to firms and the probability of voting with management on E&S proposals relative to governance proposals. The unit of observation is i, j, p, t representing investor i, firm j and proposal p in year t. *Vote with management* is a dummy variable that equals to one when investor votes with management on a proposal, and zero when investor votes against management. *Domestic* is a dummy variable that equals one if the investor and the company are domiciled in the same country, and zero otherwise. *Same Continent* is a dummy variable that equals one if the investor and the company are located in the same continent, and zero otherwise. *Common Language* is a dummy variable that equals one if the country the investor is domiciled in shares a major language with the country the company is headquartered in. *E&S* identifies if the proposal is related to environmental and social issues. *ISS recommendation* is an indicator for whether ISS recommends voting for management. Standard errors are clustered on the investor × firm level. ***, **, and * denotes significance at 1%, 5%, and 10% levels, respectively.

	All votes					
Vote with management	(1)	(2)	(3)	(4)	(5)	(6)
Domestic × E&S	0.078***			0.083***		
	(0.002)			(0.002)		
Same continent × E&S		0.074***			0.078***	
		(0.002)			(0.002)	
Common language × E&S			0.051***			0.085***
			(0.003)			(0.003)
E&S	-0.015***	-0.020***	-0.015***			
	(0.001)	(0.001)	(0.002)			
ISS recommendation	0.651***	0.651***	0.650***			
	(0.001)	(0.001)	(0.001)			
Firm×Investor×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Proposal FE	No	No	No	Yes	Yes	Yes
Observations	53,894,826	53,894,826	53,894,826	53,894,826	53,894,826	53,894,826
Adjusted R^2	0.620	0.620	0.620	0.660	0.660	0.660

1.5 What are the potential channels of home bias in shareholder voting?

1.5.1 Information advantage

The literature on geographic proximity concludes that at least a part of home bias can be explained information asymmetry. In particular, Bauer et al. (2014) document a home bias in shareholder engagement and attribute it to information advantage of the regulatory environment

in the home market. Given the large geographic heterogeneity in corporate governance standards and stewardship codes, it can be reasonably expected that investors are more familiar with the voting process in their home country.

Voting policy

To understand how investors acquire proxy information for domestic and foreign firms, I begin with a qualitative analysis of investors' voting policies. The voting policies and guidelines are collected from financial institutions' websites and from ADV and SAI filings with the SEC.[11] In total, I obtain 1209 voting policies out of 1336 investors in my sample.[12] The majority of investors acknowledge the heterogeneity of corporate governance standards and voting market mechanics by country, and therefore take into account these geographic differences in their voting policies. I inspect whether the investor explicitly distinguishes between domestic holdings and international holdings in the guideline, how the investor collects and processes information related to proxy voting for their domestic holdings and international holdings respectively, and whether the investor uses the same proxy advisor for their domestic holdings and international holdings. The emphasis is on the proxy voting process and procedure rather than the investor's position on each proxy item. Based on these criteria, I broadly classify investors' approaches to voting a global portfolio into six categories.

Table 1.6. Classification of investors: voting policy

Category	Description	No. of investors
A	Publish separate voting policies by country or region	39
B	Publish a general voting policy with regional deviation	66
C	Use a different local proxy advisor for domestic securities	24
D	Conduct in-house research on domestic holdings and outsource foreign voting to external proxy advisors	15
E	Delegate the voting authorities of domestic holdings and foreign holdings to different teams	6
F	No explicit distinction of domestic versus foreign holdings	1059

In category A, an investor either develops its own voting policies that are adapted to specific

[11] Under Rule 206(4)–6, the SEC requires investment advisers to describe their proxy voting policies and procedures to clients. Such information is disclosed in the SAIs that supplement funds' prospectus (Couvert, 2020), as well as in investment advisors' ADV filings (See `https://www.sec.gov/divisions/investment/iard` and `https://adviserinfo.sec.gov/` for details). However, the disclosure can be a short summary of their actual voting policies under the condition that further details must be provided upon client request (See `https://www.federalregister.gov/documents/2003/02/07/03-2952/proxy-voting-by-investment-advisers`). I base my analysis on the short summary in absence of a detailed voting policy.

[12] The lack of available voting policy is primarily due to three reasons: 1) dissolution of the financial institution; 2) exempt reporting advisers; and 3) no mandatory requirement for voting policy in certain jurisdictions.

market conditions or relies on standard regional voting policies provided by proxy advisors.[13] Large investors such as the Big Three (BlackRock, State Street, and Vanguard) tend to adopt this approach. Also, Japanese investors typically publish two voting policies, one for domestic holdings, the other for foreign holdings. The voting policy for domestic holdings, based on local stewardship code and best practices in corporate governance, is usually more detailed. In total, 39 investors in my sample publish separate voting policies by country/region. In category B, an investor implements a general voting policy but allows for regional deviation. These voting policies generally apply a universal voting guideline, but permit voting decisions on a case-by-case basis that accounts for local regulations and best practices. Note that here I only include investors that explicitly disclose their consideration of relevant laws, regulations and practices in foreign markets, and 66 investors in my sample fall under this category. In category C, an investor contracts a third-party proxy advisor for its international holdings (typically ISS or Glass Lewis), and in addition retains a different proxy advisor with local expertise for its domestic holdings. All of the 24 investors that follow this approach are domiciled outside the U.S. In category D, an investor has its own team to conduct proxy research on domestic holdings, but outsources proxy research on foreign holdings to external proxy advisors. This arrangement means that these investors are likely to devote more resources to monitoring domestic holdings, and therefore the votes cast at domestic firms are based on better information. Both European and North American investors use this approach. In category E, an investor delegates the voting authority of domestic holdings and foreign holdings to different teams. A few asset owners choose to delegate voting rights at foreign companies to the appointed international investment managers or representatives. Category F acts as a miscellaneous category which encompasses investors that do not mention explicitly how they address geographic differences in the voting process. This could be because the investor implicitly follows the region-specific policy provided by proxy advisors or because it only votes domestic securities. In absence of disclosure, it is beyond the scope of this paper to further distinguish between this group of investors.

A common theme emerging from the voting policies is that investors often refrain from voting foreign securities, especially when the holding stake is small, due to high costs and legal restrictions. These challenges include but are not limited to share blocking, power of attorney requirement, insufficient time for proxy research (e.g., early cut-off date), mandatory physical

[13] Both ISS and Glass Lewis publish their voting policies for each region on their websites (`https://www.issgovernance.com/policy-gateway/voting-policies/` and `https://www.glasslewis.com/voting-policies-current/`).

attendance at annual general meetings, and language barrier. These factors again highlight the information disadvantage of voting abroad.

Overall, investors generally adopt a more hands-on approach towards voting domestic holdings through higher voting turnout, more active engagement, in-depth analysis, and in-house research on domestic firms. This behavior is consistent with the information specialization theory (Van Nieuwerburgh and Veldkamp, 2009).

Cross-sectional analysis

Next, I formally test in a regerssion framework whether information advantage drives promanagement voting at domestic firms by examining cross-sectional variation in home bias. I hypothesize that if local investors vote with management because they possess better information about domestic firms, this information advantage should be more pronounced when the firm/investor is located in a country with lower transparency.

To test this hypothesis, I use three proxies for information asymmetry at the country level. First, I identify whether the company is located in an English speaking country. Non-English speaking countries are in general more opaque since materials in English are less commonly available. Second, I obtain the financial disclosure index from Jin and Myers (2006). It is based on results from surveys about the level and effectiveness of financial disclosure in different countries in the Global Competitiveness Reports. The responses range from one to seven, with higher values representing higher level of transparency. Third, I rely on the index of governance transparency in Bushman et al. (2004), which measures the prevalence of disclosures related to corporate governance. Each country is rated along several dimensions of corporate governance, including board structure and director remuneration. *Governance* is the average percentile rank within the sample of countries across all categories, so it ranges from 0 to 100, with 100 representing the highest transparency level.

I interact *Domestic* with each of these three transparency variables in Equation (1.2).[14] Based on my hypothesis, I expect the coefficients on all the interaction terms to be negative, which indicates an increase in promanagement voting for domestic firms as transparency level deteriorates in the home country (i.e., as information asymmetry becomes larger).

Table 1.7 reports the results. In Column 1, the coefficient on the interaction *Domestic*×*English* is negative and significant at the 1% level, while the coefficient on *Domestic* remains positive

[14] I skip the interaction with the *Same Continent* and *Common Language* variables. The transparency measures are constructed on the country level, so a country-level indicator for local investor is more appropriate here.

Table 1.7. Information environment and voting with management

This table presents cross-sectional analyses on the relation between the probability of voting with management and investors' proximity to firms. The unit of observation is i, j, c, p, t representing investor i, firm j in country c, proposal p, and year t. *Vote with management* is a dummy variable that equals to one when investor votes with management on a proposal, and zero when investor votes against management. *Domestic* is a dummy variable that equals one if the investor and the company are domiciled in the same country, and zero otherwise. *English* identifies whether the firm is located in an English-speaking country. *Disclosure* is the financial disclosure index from Jin and Myers (2006), ranging from one to seven (the larger the value, the higher is the transparency level). *Governance* is the governance transparency index in Bushman et al. (2004), ranging from 0 to 100 (the larger the value, the higher is the transparency level). *Early Cutoff* identifies whether the firm is located in a country with a cut-off date 6 days or more ahead of the shareholder meeting. *Country weight* is the number of companies on which investor i has cast vote(s) in country c (where company j is headquartered) as a proportion of the total number of companies investor i has voted on in year t. Sample size change due to missing values of *Disclosure* and *Governance*. Standard errors are clustered on the investor × firm level. ***, **, and * denotes significance at 1%, 5%, and 10% levels, respectively.

	All votes			
Vote with management	(1)	(2)	(3)	(4)
Domestic	0.063***	0.452***	0.066***	0.045***
	(0.002)	(0.027)	(0.005)	(0.001)
Domestic × English	-0.019***			
	(0.002)			
Domestic × Disclosure		-0.070***		
		(0.004)		
Domestic × Governance			0.000***	
			(0.000)	
Domestic × Early Cutoff				0.047***
				(0.004)
Country weight	0.018***	-0.021***	0.017***	0.019***
	(0.002)	(0.004)	(0.002)	(0.002)
Investor×Year FE	Yes	Yes	Yes	Yes
Proposal FE	Yes	Yes	Yes	Yes
Observations	54,498,614	29,523,624	50,811,228	54,498,614
Adjusted R^2	0.461	0.471	0.450	0.461

and statistically significant. This result indicates that investors are more likely to vote with management at domestic firms, and the probability of voting with management is 1.9% higher if the investor/company is located in a non-English speaking country. Similarly, Column (2) shows that the home bias is stronger in countries with fewer financial disclosures. The effect of governance transparency is minimal as reported in Column (3).

In addition, I use another measure of information environment strictly related to proxy voting. In the proxy voting process, all markets stipulate a deadline for shareholders to register their votes ahead of the shareholder meeting ("cutoff date"), and this cutoff date varies across countries (NBIM, 2020). As noted in many investors' voting policies, certain markets operate with earlier cutoff dates that prevent investors to incorporate information that becomes available closer to

the meeting date into their voting decisions, and this is identified by investors as one of the major barriers of voting abroad. In a world with information asymmetry, this obstacle is likely to be higher for foreign investors as domestic investors have access to private information prior to the cutoff date. I encode a dummy variable for countries with a cut-off date 6 days or more ahead of the shareholder meeting and interact it with *Domestic*.[15] Column (4) of Table 1.7 reports the regression results. The coefficient on the interaction term is positive and significant at the 1% level. Note that the size of the estimated coefficient on *Domestic* is almost the same as in Column (1) of Table 1.4, and on top of that, early cutoff date further increases the probability of voting with management at domestic firms by 4.7%. The economic magnitude of the cutoff rule is much larger than *English*, presumably because it is more directly related to the information barrier of casting votes.

1.5.2 Favoritism

The geographic proximity between investors and their portfolio firms often results in shared demographics and social networks, as well as increased familiarity and ease of recalling domestic firms. Consequently, investors are more likely to exhibit a predisposition towards favoring domestic firms, thereby increasing the likelihood of voting with the management of these domestic entities.

The influence of favoritism on promanagement voting is likely to be stronger in environments of greater agency conflicts or weaker governance controls, because legal and regulatory environments are important determinants of how investors exercise their shareholder rights (Porta et al., 1998; Kim et al., 2016; Iliev et al., 2015). Therefore, I hypothesize that if local investors vote with management due to favoritism, this behavior should be more visible when the firm/investor is located in a country with worse outside investor protection.

To test this hypothesis, I use three proxies for outside investor protection at the country level. The first is the anti-self-dealing index from Djankov et al. (2008), a measure of legal protection of minority shareholders against expropriation by corporate insiders. The second is the revised anti-director-rights index also from Djankov et al. (2008). The index measures how strongly the legal system favors minority shareholders against managers or dominant shareholders in the corporate decision-making process, including the voting process. The third one is the corruption index from Porta et al. (1999), which captures the overall level of corruption in a government.

[15]The cutoff date by country is obtained from NBIM (2020).

It varies on a scale from zero to ten, with lower scores representing higher levels of corruption.

Again, I add interaction terms for each proxy in the main specification. My hypothesis predicts negative coefficients on the interaction terms, which indicates an increase in promanagement voting for domestic firms given a decrease in outside investor protection. Table 1.8 shows that local investors are more likely to side with firm management in countries that offers less protection to outside investors (and thus breeds favoritism), and this finding is robust to different proxies of outside investor protection.

Table 1.8. Outside investor protection and voting with management

This table presents cross-sectional analyses on the relation between the probability of voting with management and investors' proximity to firms. The unit of observation is i, j, c, p, t representing investor i, firm j in country c, proposal p, and year t. *Vote with management* is a dummy variable that equals to one when investor votes with management on a proposal, and zero when investor votes against management. *Domestic* is a dummy variable that equals one if the investor and the company are domiciled in the same country, and zero otherwise. *Anti-self-dealing* is a measure of legal protection of minority shareholders against expropriation by corporate insiders in Djankov et al. (2008), ranging from zero to one (the larger the value, the better is the protection of outside investors). *Anti-director-rights* is the revised anti-director-rights index in Djankov et al. (2008) ranging from zero to six (the larger the value, the better is the protection of minority shareholders). *Corruption* is the corruption index in Porta et al. (1999) ranging from zero to ten (the larger the value, the lower is the corruption level). *Country weight* is the number of companies on which investor i has cast vote(s) in country c (where company j is headquartered) as a proportion of the total number of companies investor i has voted on in year t. Sample size change due to missing values of *Anti-self-dealing*, *Anti-director-rights* and *Corruption*. Standard errors are clustered on the investor × firm level. ***, **, and * denotes significance at 1%, 5%, and 10% levels, respectively.

	All votes		
Vote with management	(1)	(2)	(3)
Domestic	0.109***	0.172***	0.389***
	(0.003)	(0.003)	(0.010)
Domestic × Anti-self-dealing	-0.093***		
	(0.004)		
Domestic × Anti-director-rights		-0.036***	
		(0.001)	
Domestic × Corruption			-0.038***
			(0.001)
Country weight	0.018***	0.014***	0.010***
	(0.002)	(0.002)	(0.002)
Investor × Year FE	Yes	Yes	Yes
Proposal FE	Yes	Yes	Yes
Observations	54,283,064	54,283,064	54,162,169
Adjusted R^2	0.461	0.461	0.461

1.5.3 Dominant channel

The preceding findings have shown that local investors vote more favorably with firm management, but as discussed in the sections above, the greater support for management could be due to either informed voting or favoritism. In an attempt to further disentangle these two channels, I examine this home bias under certain conditions of special interest.

Consensus proposals

When there is a high degree of consensus on an agenda item, we would expect the information advantage vs. favoritism effects to predict voting in the opposite direction. When ISS and management recommend voting in the same direction, investors that engage in robo-voting (always follow ISS recommendation) would vote with management in this setting. However, if local investors do have an information advantage, they are more likely to arrive at a voting decision that differs from ISS (Iliev and Lowry, 2014), which would be voting against management in this case. In other words, an investor that votes based on superior information is expected to more often vote against management if ISS and management recommendations converge, whereas an investor that votes because of favoritism is likely to more often vote for management.

Apart from agreement between ISS and firm management, another source of consensus comes from the aggregated views of all shareholders measured by the voting outcome. If a proposal receives a high support rate from shareholders, an investor with unique information has a higher likelihood to deviate from the conventional wisdom. In contrast, favoritism incentivizes consistent support for management.

Based on the arguments above, the exploration of local investors' pro-management voting tendency concerning consensus items could offer insights into the predominant channel—whether it is information advantage or favoritism—contributing to the "home bias." Therefore, I introduce an interaction term between local investor and consensus proposal to the model in Equation (1.2). Two dummy variables are used to identify consensus proposals. The variable *ISS recommendation* takes the value of one if ISS recommendation is the same as management recommendation. *High support* takes the value of one when the aggregate support for a proposal among all shareholders ranks in the highest decile for each year, making them the most supported proposals in that year.

The results are reported in Table 1.9. The coefficient of *Domestic* is positive and significant, while its interaction with ISS recommendation is negative and significant. Similarly, the inter-

actions between ISS recommendation and the other proxies for local investors, namely *Same continent* and *Common language*, also display negative and significant coefficients. Compared to foreign investors, domestic investors are significantly more likely to vote with management when ISS issues a negative recommendation and significantly more likely to oppose management when ISS agrees with management. This result implies that when there is consensus between ISS and firm management, investors are more likely to oppose both ISS and management at domestic firms than at foreign firms. Given ISS's "certification effect" (Li, 2018), the divergence from ISS recommendations signals that investors possess private information about domestic firms which may not be available to proxy advisors. The results on the other measure of consensus proposal (*High support*) in Column (4)-(6) are similar.

Table 1.9. Local investors' support for management on consensus proposals

This table presents the relation between the probability of voting with management and investors' proximity to firms. The unit of observation is i, j, c, p, t representing investor i, firm j in country c ,and proposal p in year t. *Vote with management* is a dummy variable that equals one when investor votes with management on a proposal, and zero when investor votes against management. *Domestic* is a dummy variable that equals one if the investor and the company are domiciled in the same country, and zero otherwise. *Same Continent* is a dummy variable that equals one if the investor and the company are located in the same continent, and zero otherwise. *Common Language* is a dummy variable that equals one if the country the investor is domiciled in shares a major language with the country the company is headquartered in, and zero otherwise. *ISS recommendation* is a dummy variable that equals one when ISS recommends voting for management, and zero otherwise. *High support* is a dummy variable that equals one if overall support for management is in the top decile for all proposals in that year. *Country weight* is the number of companies on which investor i has cast vote(s) in country c (where company j is headquartered) as a proportion of the total number of companies investor i has voted on in year t. Standard errors are clustered on the investor × firm level. ***, **, and * denotes significance at 1%, 5%, and 10% levels, respectively.

	All votes					
Vote with management	(1)	(2)	(3)	(4)	(5)	(6)
Domestic	0.147***			0.047***		
	(0.002)			(0.001)		
Domestic × ISS recommendation	-0.108***					
	(0.002)					
Domestic × High support				-0.030***		
				(0.001)		
Same continent		0.088***			0.041***	
		(0.002)			(0.001)	
Same continent × ISS recommendation		-0.052***				
		(0.002)				
Same continent × High support					0.000	
					(0.001)	
Common language			0.086***			0.050***
			(0.002)			(0.001)
Common language × ISS recommendation			-0.041***			
			(0.002)			
Common language × High support						-0.035***
						(0.001)
Country weight	0.017***	0.031***	0.066***	0.021***	0.034***	0.073***
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
Investor×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Proposal FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54,498,614	54,498,614	54,498,614	42,168,511	42,168,511	42,168,511
Adjusted R^2	0.462	0.461	0.461	0.451	0.451	0.451

One-size-fits-all voting

If investors possess superior information regarding domestic companies, they are anticipated to conduct separate assessments of proposals for each firm in their domestic portfolios. Consequently, they would be less likely to adopt one-size-fits-all voting strategies for their domestic holdings. Conversely, if domestic investors are primarily motivated by favoritism toward management, it follows that they would be more likely to employ a one-size-fits-all approach by consistently supporting management in their domestic holdings.

To construct a one-size-fits-all measure of voting, I follow the methodology outlined by Lowry et al. (2022) and Di Giuli et al. (2022b).[16] For each investor's votes on a specific topic within a given year for either domestic or foreign holdings, I compute the absolute difference between votes in favor of management and votes against management, normalized by the total number of votes. Higher values of this measure indicate a reduced level of discretionary voting across firms on the same topic.

Table 1.10 reports estimates of regressions where the dependent variable is the one-size-fits-all measure of voting and the independent variable of interest is a dummy variable indicating whether the votes are cast for domestic or foreign holdings. The coefficient on *Domestic* is negative and statistically significant. Results show that investors are less likely to have a one-size-fits-all strategy for domestic holdings, consistent with the premise of informed voting.

Table 1.10. One-size-fits-all voting at home and abroad

This table examines investors' tendency to vote in a one-size-fits-all manner in domestic vs. foreign holdings. The dependent variable is a measure of one-size-fits-all voting computed at the investor-year-holding-topic level, as the absolute difference of the number of votes with management minus the number of votes against management, scaled by the total number of proposals. *Domestic* is a dummy variable that equals one if the votes are cast on domestic firms, and zero otherwise. Standard errors are clustered on the investor level. ***, **, and * denotes significance at 1%, 5%, and 10% levels, respectively.

One-size-fits-all voting	(1)	(2)	(3)
Domestic	-0.010***	-0.011***	-0.012***
	(0.004)	(0.004)	(0.004)
Investor FE	Yes	Yes	No
Year FE	No	Yes	No
Investor × Year FE	No	No	Yes
Observations	377,614	377,614	377,614
Adjusted R^2	0.090	0.092	0.137

Taken together, the differential effects of geographic proximity on voting with management on consensus proposals relative to other proposals as well as the reduction of one-size-fits-all voting in domestic firms relative to foreign firms suggest that information advantage seems to be the dominant cause of home bias. However, these results do not fully rule out the effect of favoritism. It remains plausible that favoritism does exist, but is overshadowed by the effect of information advantage.

[16] Lowry et al. (2022) and Di Giuli et al. (2022b) construct the one-size-fits-all measure on the fund × agenda item × year level where the agenda item is supposedly identified through the *ISSAgendaItemID* variable in the ISS Voting Analytics database. This variable categorizes proposals into different types such as say on pay, director elections and auditor ratification. The closest equivalent of this variable in the Insightia voting database is *Proposal Sub Category*.

1.6 Conclusion

The globalization of portfolio management gives rise to the need of exercising shareholder rights internationally. However, the ability of investors to cast informed votes is impeded by inconsistent corporate governance standards and proxy voting processes across markets. These geographic disparities result in different voting behaviors at domestic and foreign firms. In this paper, I examine whether the probability of voting with management is higher when the investor and the company are located in the same country or continent, and when they share a common language. I further propose two potential channels to explain this phenomenon.

Using a global data set from 2012 to 2022, I provide robust evidence that there is a significant home bias in shareholder voting. The results are consistent with two possible explanations: information advantage of local investors and favoritism towards domestic firms. A systematic review of investors' voting polices suggests that investors actively seek out more information about domestic firms during the voting process in order to gain an information advantage in their home countries. However, an important caveat of this study is that I cannot precisely quantify the effect of each channel, nor can I rule out other alternative explanations of the home bias, even though the research design and robustness checks mitigate concerns about omitted variable bias and reverse causality.

Overall, this study sheds light on an important type of market inefficiency in shareholder voting. Because institutional investors possess an inherent information advantage when voting in their home countries, regulators need to level the playing field of information acquisition in proxy voting for foreign investors who constitute an essential part of the global governance mechanism. In view of the large geographic heterogeneity, more cross-country studies on shareholder voting are warranted.

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1.A Management vs. shareholder proposals

Proposals may be sponsored either by management or by shareholders. Management and shareholder proposals tend to be of a different nature. While management proposal contain routine matters that require shareholder approval, such approval is often a matter of formality. In contrast, shareholder proposals target firms with poor performance and undesirable governance structures (Renneboog and Szilagyi, 2011). Shareholders file proposals at company annual meetings when they want to bring something to public attention. Voting with management on shareholder proposals shows stronger rapport with firm management, even at the risk of damaging the investor's own reputation. It is unclear if the effect of geographic proximity sustains in shareholder proposals. Therefore, I split the data into these two categories and run the main regression over these two sub-samples, respectively.

Table 1.A.1 reports the results. The coefficients for local investor are positive and statistically significant for both management and shareholder proposals. Therefore, the home bias in shareholder voting is not specific to the sponsor of the proposal.

Table 1.A.1. Home bias in management vs. shareholder proposals

This table presents the relation between the probability of voting with management and investors' proximity to firms among management and shareholder proposals, respectively. The unit of observation is i, j, c, p, t representing investor i, firm j in country c, proposal p, and year t. *Vote with management* is a dummy variable that equals one when investor votes with management on a proposal, and zero when investor votes against management. *Domestic* is a dummy variable that equals one if the investor and the company are domiciled in the same country, and zero otherwise. *Same Continent* is a dummy variable that equals one if the investor and the company are located in the same continent, and zero otherwise. *Common Language* is a dummy variable that equals one if the country the investor is domiciled in shares a major language with the country the company is headquartered in. *ISS recommendation* is an indicator for whether ISS recommends voting for management. *Country weight* is the number of companies on which investor i has cast vote(s) in country c (where company j is headquartered) as a proportion of the total number of companies investor i has voted in year t. Standard errors are clustered on the investor × firm level. ***, **, and * denotes significance at 1%, 5%, and 10% levels, respectively.

	Management proposals			Shareholder proposals		
Vote with management	(1)	(2)	(3)	(4)	(5)	(6)
Domestic	0.045***			0.072***		
	(0.001)			(0.004)		
Same continent		0.038***			0.081***	
		(0.001)			(0.004)	
Common language			0.047***			0.118***
			(0.001)			(0.006)
Country weight	0.014***	0.029***	0.062***	0.012	0.029***	0.076***
	(0.002)	(0.002)	(0.001)	(0.012)	(0.011)	(0.010)
Investor×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Proposal FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53,302,081	53,302,081	53,302,081	1,195,961	1,195,961	1,195,961
Adjusted R^2	0.454	0.454	0.454	0.540	0.541	0.541

1.B Robustness tests

1.B.1 Non-U.S. investors

As shown in Table 1.1, U.S. investors comprise nearly 70% of total investors in my sample. To test whether the results in Table 1.4 are driven by U.S. investors rather than being a global phenomenon, I run the regression for non-U.S. investors only. This also rules out the Big Three which have overshadowing market power in the asset management industry and distinctively different incentives to engage and vote (Brav et al., 2022b). Table 1.B.1 presents the estimated effect of geographic proximity on proxy voting of non-U.S. investors. The effect of geographic proximity remains statistically significant at the 1% level, albeit at a smaller scale compared to Table 1.4.

Table 1.B.1. Non-U.S. investors

This table presents the relation between the probability of voting with management and investors' proximity to firms, using a subsample of non-U.S. investors. The unit of observation is i, j, c, p, t representing investor i, firm j in country c, proposal p, and year t. *Vote with management* is a dummy variable that equals to one when investor votes with management on a proposal, and zero when investor votes against management. *Domestic* is a dummy variable that equals one if the investor and the company are domiciled in the same country, and zero otherwise. *Same Continent* is a dummy variable that equals one if the investor and the company are located in the same continent, and zero otherwise. *Common Language* is a dummy variable that equals one if the country the investor is domiciled in shares a major language with the country the company is headquartered in. *ISS recommendation* is an indicator for whether ISS recommends voting for management. *Country weight* is the number of companies on which investor i has cast vote(s) in country c (where company j is headquartered) as a proportion of the total number of companies investor i has voted on in year t. Standard errors are clustered on the investor × firm level. ***, **, and * denotes significance at 1%, 5%, and 10% levels, respectively.

	All votes cast by non-U.S. investors					
Vote with management	(1)	(2)	(3)	(4)	(5)	(6)
Domestic	0.012***			0.012***		
	(0.001)			(0.001)		
Same continent		0.010***			0.010***	
		(0.001)			(0.001)	
Common language			0.027***			0.026***
			(0.001)			(0.001)
ISS recommendation	0.654***	0.654***	0.654***			
	(0.001)	(0.001)	(0.001)			
Country weight	0.058***	0.054***	0.054***	0.055***	0.053***	0.052***
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)
Investor × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm × Year FE	Yes	Yes	Yes	No	No	No
Firm × Proposal × Year FE	No	No	No	Yes	Yes	Yes
Observations	18,174,912	18,174,912	18,174,912	18,174,912	18,174,912	18,174,912
Adjusted R^2	0.367	0.367	0.367	0.456	0.456	0.456

1.B.2 Investors with domestic and foreign holdings

Some investors only vote at domestic firms, either because their investment portfolio only consists of domestic firms or because they decide to refrain from voting at foreign firms. It is not possible to compare how these investors' voting behavior may differ at home and abroad. Hence, I restrict the sample to investors that have cast votes at both domestic firms and foreign firms during the sample period. This restriction leaves 1256 investors in the sample. Table 1.B.2 presents the results for investors that vote internationally, and it is very similar to Table 1.4.

Table 1.B.2. Investors with international voting

This table presents the relation between the probability of voting with management and investors' proximity to firms, excluding investors that only vote domestically. The unit of observation is i, j, c, p, t representing investor i, firm j in country c, proposal p, and year t. *Vote with management* is a dummy variable that equals to one when investor votes with management on a proposal, and zero when investor votes against management. *Domestic* is a dummy variable that equals one if the investor and the company are domiciled in the same country, and zero otherwise. *Same Continent* is a dummy variable that equals one if the investor and the company are located in the same continent, and zero otherwise. *Common Language* is a dummy variable that equals one if the country the investor is domiciled in shares a major language with the country the company is headquartered in. *ISS recommendation* is an indicator for whether ISS recommends voting for management. *Country weight* is the number of companies on which investor i has cast vote(s) in country c (where company j is headquartered) as a proportion of the total number of companies investor i has voted on in year t. Standard errors are clustered on the investor × firm level. ***, **, and * denotes significance at 1%, 5%, and 10% levels, respectively.

	All votes cast by investors with international voting					
Vote with management	(1)	(2)	(3)	(4)	(5)	(6)
Domestic	0.046***			0.046***		
	(0.001)			(0.001)		
Same continent		0.041***			0.040***	
		(0.001)			(0.001)	
Common language			0.049***			0.049***
			(0.001)			(0.001)
ISS recommendation	0.652***	0.652***	0.652***			
	(0.001)	(0.001)	(0.001)			
Country weight	0.018***	0.031***	0.067***	0.017***	0.031***	0.067***
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
Investor×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm×Year FE	Yes	Yes	Yes	No	No	No
Proposal FE	No	No	No	Yes	Yes	Yes
Observations	53,807,128	53,807,128	53,807,128	53,807,128	53,807,128	53,807,128
Adjusted R^2	0.421	0.422	0.421	0.463	0.463	0.463

Two-Dimensional Activeness: Exploring the Interplay Between Active Ownership and Active Portfolio Management

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Abstract

This paper examines the interplay between active portfolio management and active ownership. We find a positive relationship between an increase in active weight – measured as the difference between a company's portfolio and benchmark weight – and the probability of active voting, defined as voting against ISS recommendations. A one-percentage-point increase in active weight corresponds to a 0.24 percentage point increase in the probability of voting actively on contentious proposals. Additionally, we observe heightened engagement in overweighted companies compared to underweighted ones, with a one-percentage-point rise in active weight associated with a 0.57 percentage point increase in the probability of active voting. Interestingly, there is no apparent relationship between environmental and social (ES) proposals and active weights. These findings imply that active mutual funds, as a group with heterogeneous active portfolios, is an important counterbalance to proxy advisors.

Keywords: Shareholder voting; mutual funds; corporate governance; active ownership
JEL Classification G11; G30

2.1 Introduction

Actively managed mutual funds aim to outperform their benchmark, motivating fund managers to build a high-performing portfolio and engage in active ownership to improve portfolio company value. If active portfolio is constructed skillfully, increasing the degree of active ownership results in higher alpha. However, the incentive to be an active owner is generally lower than the incentive to build an improved active portfolio. While fund managers receive all the benefits of building a better portfolio, they only receive a fraction of the resulting benefits from active ownership.

It is a demanding task to increase the return of a portfolio company. There are many different channels through which an owner can influence a company. An important and observable channel is the voting decisions made by the funds in shareholder meetings. Institutional investors are obligated to vote on their portfolio companies during shareholder meetings, and the SEC requires mutual funds to disclose their voting policies and proxy voting records since 2003.[1]

This paper examines the interplay between active ownership and active portfolio management. We discuss the gains from active ownership in the context of relative performance evaluation, that is, the effect on gross alpha. To create alpha, the portfolio weights of the companies must deviate from the benchmark weights, which represents the fund manager's skill for active portfolio management. The difference between the weights of the portfolio and the benchmark is named active weight. Active ownership may lead to higher returns, which create a higher alpha. The higher fund alpha attracts more fund inflows, constituting a type of flow incentives for active engagement (Lewellen and Lewellen, 2022).

When decomposing the fund alpha into contributions from individual companies in the active portfolio, it can be seen that the contribution from companies with larger active weights is higher. Since the improvement in relative performance is proportional to active weight, we hypothesize that the size of active weight in a portfolio company positively influences the fund's propensity to vote actively in that company. We term this hypothesis *the proportional benefit hypothesis*.

Active weight is the absolute value of either an overweight or an underweight. By definition, aggregated overweights are perfectly counterbalanced by underweights in other stocks. This symmetry creates a long-short portfolio. As emphasized by Bebchuk et al. (2017), increasing the value of portfolio companies will positively contribute to the gross alpha of overweighted company stocks. However, to achieve a corresponding positive effect from underweighted companies, active

[1]See `https://www.sec.gov/rules/final/33-8188.htm` (last accessed 29 December 2023).

ownership activity must *destroy* the company value, that is, reduce the return of the stock. We can think of it as a minus weight multiplied by a negative return impact leading to a positive active return.

We suggest that active ownership on underweighted companies may be less incentivizing than that on overweighted companies. For example, a long-only fund can only underweight stocks until a zero-weight position in the company. Furthermore, a zero-weight position will not grant voting rights. Based on this observation, we propose another hypothesis that states an asymmetry in active voting between portfolio companies with overweights and underweights. The incentives to invest in collecting and analyzing information related to voting are stronger for overweighted stocks than for underweighted stocks. We term this hypothesis *the asymmetric benefit hypothesis*.

We quantify how active the funds are in their active ownership by examining how often they vote *against* the recommendations of the largest proxy advisory service company, ISS (Iliev and Lowry, 2014; Iliev et al., 2021).[2] Making informed voting decisions involves the costs of acquiring information about portfolio companies. A way of reducing the cost associated with voting is to rely on the services of proxy advisors (see, e.g., Larcker et al., 2015; Matsusaka and Shu, 2023). Iliev and Lowry (2014) documents that more than 25% of the mutual funds mechanically follow the advice of proxy advisors. As a result, proxy advisors have a substantial influence on voting outcomes. For example, Malenko and Shen (2016) employ a regression discontinuity design and find that a negative ISS recommendation on a say-on-pay proposal results in a 25% reduction in voting support.

When outsourcing voting to proxy advisors, shareholders may fail to internalize the impact of their actions on other shareholders, leading them to free-ride on the active engagement of other shareholders (Malenko and Malenko, 2019; Bebchuk et al., 2017).[3] However, for active owners, proxy advisor recommendation is one of many inputs in their voting decision (Matsusaka and Shu, 2021). Active owners often complement it with independent research. For example, Iliev et al. (2021) analyze investor views on EDGAR company filings and find that investors commonly conduct governance research, particularly for large firms and outside of the busy proxy season. In response to investors' demand for information, corporations increasingly disclose directors' expertise in image-based formats to decrease investors' costs of evaluating proposals for director

[2] In the literature, this measure is referred to as both active and informed voting.

[3] See Section "The Limits of Competition: Actively Managed Funds" in Bebchuk et al. (2017) for a discussion of incentives to engage in portfolio companies for actively managed mutual funds.

nominees, which leads to less reliance on ISS (Becher et al., 2023). These studies highlight that more disclosure and more independent research increase the probability of informed voting.

We test our hypotheses using a sample that includes all actively managed equity funds based in the United States (US) or owned by a US-registered asset management company. We focus on actively managed funds, since passive index funds lack the incentive to outperform the benchmark.[4] In order to compute active weight, we collect data on fund portfolio and benchmark index from Morningstar Direct. Data on mutual fund voting is obtained from Insightia and contains voting records of US-based mutual funds, including votes on all proposals from annual and extraordinary shareholder meetings. We follow Heath et al. (2022) and focus on contentious proposals in our main analysis, that is, proposals where ISS and the company management have opposing views.

Our first hypothesis (*proportional benefit hypothesis*) states that the funds' incentives to cast informed votes are proportional to the active weights of portfolio companies. We test this hypothesis with panel regressions, including a rich set of saturated fixed effects that control for time, fund, company, and proposal specific characteristics. We find that the size of the active weight in a company positively affects the likelihood of active voting, holding the portfolio weight constant. An increase of one percentage point in active weight leads to an average increase of 0.24 percentage points in the probability of voting against ISS on contentious proposals, after controlling for time-varying fund characteristics and proposal characteristics. The results remain unchanged under different model specifications and clustering methods. Our results are also robust to alternative voting benchmarks where we use the votes of the Norwegian Oil Fund as a signal of informed voting and where voting against both ISS and Glass Lewis is taken into consideration.

Our second hypothesis (*asymmetric benefit hypothesis*) argues that incentives to vote actively are stronger for overweighted companies. The results show that overweighted companies are the main driver of active voting, as an increase of one percentage point in overweight leads to an average increase of 0.57 percentage points in the probability of voting against ISS on

[4]Active and passive mutual funds exhibit different incentives to monitor their portfolio companies. Active funds are driven by incentives related to relative performance evaluation, whereas index funds merely mirror the index. Although we focus on active funds in this paper, the empirical evidence on these differences for index funds is mixed. Although Heath et al. (2022) find that index funds engage in less monitoring compared to actively managed funds, Lakkis (2021) claim that increased index fund holdings create greater incentives for a fund family to monitor. Additionally, Hshieh et al. (2021) find that passive funds vote similarly to active funds within the same fund family but also participate in "behind-the-scenes" involvement in addition to voting at the annual meeting. This tendency to use behind-the-scenes participation as a monitoring tool is aligned with the findings of a survey conducted by McCahery et al. (2016).

contentious proposals. Viewed from a broader level, mutual funds apply different governance mechanisms to overweighted and underweighted companies. In other words, fund managers primarily rely on selling their shares ("exit") to govern underweighted companies and prefer to cast independent votes to monitor overweighted companies ("voice"). This finding is consistent with the observation in Becht et al. (2019) that when active engagement and voting does not generate satisfactory results, active fund managers often choose to exit the company.

We also document substantial heterogeneity among proposal types. Management and shareholder proposals are of a different nature, and the implications for active voting are also different (Cvijanovic et al., 2016; Gantchev and Giannetti, 2020). We find that the effect of active weight on active voting is more pronounced for proposals sponsored by management. In addition, we argue that the incentives to vote actively arising from active weights are larger for proposals that pass or fail by a small margin given the pivotal role of contested votes. When it comes to environmental & social (ES) proposals, the financial incentives of active engagement may be misaligned with the fund investors' non-financial preferences (Michaely et al., 2022). In light of this potential conflict between financial and non-financial motives, we do not find statistically significant effects of active weight on active voting regarding ES proposals.

Our study contributes to the literature on the incentives of active ownership. While previous studies underscore the importance of portfolio weight and holding size in mutual fund voting (Iliev and Lowry, 2014; Schwartz-Ziv and Wermers, 2022), they do not account for the incentives related to relative performance. In the framework of Lewellen and Lewellen (2022), portfolio weight contributes solely to the direct incentives of engagement, whereas active weight determines the indirect (flow) incentives. Notably, despite the fact that indirect incentives account for half of the total benefits of active engagement (Lewellen and Lewellen, 2022), empirical investigations into this aspect remain scarce.

We bridge a gap in the literature by empirically exploring the nexus between the potential benefits of active ownership, contingent on relative performance, and mutual fund voting behavior. While controlling for portfolio weight in our main regression, our study differs from Iliev and Lowry (2014) by incorporating data on both fund portfolio and benchmark portfolio to isolate the effect of active weight. Our findings concerning the proportional benefits of active weight provide empirical support for the flow incentive model of active engagement in Lewellen and Lewellen (2022); that is, mutual funds are more inclined to engage in active voting when the effect on gross alpha is greater. Moreover, Bebchuk et al. (2017) predict that relative performance could only provide actively managed funds with incentives to improve value in

overweighted stocks. We find empirical support for this prediction by showing that active voting is primarily driven by overweighted companies. Our findings imply that the incentives of active funds to outperform the benchmark can mitigate the free-rider problem when the active weights are sufficiently large. Funds are more inclined to bear the costs of independent research when the potential alpha contribution is substantial.

This paper also relates to the growing literature on shareholder voting. The existing literature has explored the impact of third-party proxy advisors on voting and governance outcomes (see, e.g., Alexander et al., 2010; Ertimur et al., 2013; McCahery et al., 2016; Boone et al., 2020; Albuquerque et al., 2020). However, our results suggest substantial nuances to investors' reliance on proxy advisors. Given the diverse strategies of portfolio construction among actively managed funds, each fund assigns different active weights to different stocks and chooses to conduct independent research and vote actively on different companies. Since a company can have different active weights in different fund portfolios, the votes received by the company contain valuable information from an array of active funds. Therefore, active funds collectively serve as a counterbalance to proxy advisors. As actively managed funds increasingly lose terrain against passive index funds, the interplay between stock selection and activism plays an important role in understanding the changing landscape in the asset management industry (Baker et al., 2023).[5]

The remainder of the paper is structured as follows. In Section 2.2 we present the related literature and the theoretical background of the hypotheses. Section 2.3 presents the data and summary statistics. Section 2.4 presents the empirical results and Section 2.5 discusses the results and concludes the paper.

2.2 Hypothesis development

Motivation to achieve a high gross alpha comes from the fund company and the individual fund manager. From the fund company's standpoint, higher alpha results in increased new capital inflows, generating higher income for the fund company. For example, Ferreira et al. (2012) and Ben-David et al. (2022) show empirical evidence on the flow-performance relationship for the US mutual fund. From the individual fund manager's perspective, strong performance can translate into higher performance-based bonuses (see, e.g., Ma et al., 2019) and enhanced career development (see, e.g., Hu et al., 2011).

[5]For a review of the literature on implications from the growth in index funds on corporate governance issues, see, Brav et al. (2022b).

The return of actively managed funds is evaluated against a benchmark index. The difference between the fund's and benchmark returns is commonly known as the gross alpha, calculated using returns before fees. The starting point is the gross alpha of an actively managed fund j in time t, decomposed into the sum of the contribution of each stock i in the active portfolio:

$$\alpha_{j,t} = R_{j,t} - R_{b,t} = \sum_{i=1}^{N} \underbrace{(w_{j,i,t} - w_{b,i,t})}_{\text{Active weight}} \times r_{i,t}, \tag{2.1}$$

where r_i is stock i's return in time t, and $w_{j,i} - w_{b,i}$ is the difference between the portfolio weight of stock i in fund j and the corresponding portfolio weight in the fund's benchmark b. This difference in portfolio weights will hereafter be referred to as the active weight of stock i.

Equation (2.1) shows that the source of the return differences between the fund and the benchmark is the active weights, which may be positive or negative. Since mutual funds are long-only, active weights must sum to 0%, meaning that aggregated overweights must be balanced by underweights in other stocks. Consequently, the fund's gross alpha can be explained as the cumulative contribution of each stock in the active portfolio. When stock i has a positive (negative) return, it will contribute positively to the gross alpha of the fund if and only if the active weight is positive (negative). Therefore, gross alpha is often used as a measure of fund manager ability, i.e., the stock-picking skill of the manager.

Stock returns are treated as exogenous to the fund manager in the simplest framework. However, we can expand the framework with the notion that the fund manager can influence stock returns through active ownership. Since we want to examine the interplay between active portfolio management and active ownership, we describe a framework outlining the two "sources" to create fund alpha. The first source is active portfolio management, and the second is active ownership. We illustrate the framework in the following equation:

$$\alpha_{j,t} = R_{j,t} - R_{b,t} = \sum_{i=1}^{N} \underbrace{(w_{j,i,t} - w_{b,i,t})}_{\text{Active portfolio management}} \times \underbrace{r_{i,t}}_{\text{Active ownership}}. \tag{2.2}$$

Unlike other methods of increasing alpha, using active ownership to enhance alpha does not increase the financial risk in the fund, but it requires resource allocation toward governance. Previous studies show that the value-enhancing impact of corporate governance can be significant. For example, Cunat et al. (2012) find that passing a governance proposal increases shareholder value by 2.8%. Equation (2.2) presents the alpha contribution within the fund. To show how

the variation in alpha contribution affects active ownership, Appendix 2.A presents a simple example that illustrates the incentives for a fund manager to engage in active ownership by voting based on active weights. Lastly, we derive two testable relations between active weights and active ownership.

Proportional benefit hypothesis

The first hypothesis is based on the fact that the effect of active voting in a company on the fund's gross alpha is proportional to the size of the active weight in the company. This parallels the model in Lewellen and Lewellen (2022). Since the research costs before voting are borne entirely by the fund itself, we posit that to be willing to incur these costs and vote actively, the potential net benefits must be positive. Funds with negative net benefits of active voting find it optimal to passively follow the recommendation of a proxy advisory service company. On the basis of this, we hypothesize that the active weight scale in a portfolio company positively influences the fund's propensity to vote actively in that company.

Asymmetric benefit hypothesis

The second hypothesis is based on the prediction that funds will only positively enhance the value of companies that are overweighted (Bebchuk et al., 2017). Ownership must destroy company value and reduce stock return in underweighted companies to achieve a positive effect on gross alpha. Furthermore, funds do not possess voting rights in companies with zero portfolio weight, which is the strongest possible indication of a fund's disbelief in a company. Since the funds are long-only, the largest possible active underweight is equal to the negative value of the weight in the benchmark. The motives for holding an underweighted company with voting rights are less evident compared to overweighted companies. Therefore, we also hypothesize that the relationship between active weight and active voting is more pronounced for overweighted stocks than underweighted stocks.

2.3 Data, summary statistics, and research design

This section presents the data and summary statistics. Additional details on the sample construction is presented in Appendix 2.B.

2.3.1 Data

This section describes details on the assembling and construction of data on fund portfolio, fund characteristics, and fund voting. We also explain how the data from different sources are merged to construct the final data set. Additional data details are presented in Appendix 2.B.

Mutual fund data

Mutual fund data is acquired from Morningstar Direct. First, we collect portfolios for all US-based equity mutual funds that have been active since January 1, 2012. Details on sample selection are provided in Appendix 2.B.1. The fund portfolio data include monthly portfolio weights for the companies in the portfolio, as well as company names and Morningstar's unique stock identifier, *Security ID*.

To complement the portfolio data, we also gather cross-sectional fund information and time series data on fund size, returns, and fees. Cross-sectional information includes funds' investment area, domicile, benchmark, and management firm. Since Morningstar covers active, merged, and liquidated funds, it is survivorship bias-free. All variables are winsorized at the 1% and 99% percentiles.

Morningstar treats separate share classes within the same fund as individual observations, despite them having the same holdings and the same returns before expenses. Our unit of observation is the share class that Morningstar identifies as the oldest share class.[6] Fund-level variables are subsequently aggregated across the different share classes.

Benchmark data

Morningstar provides data on both the primary prospectus benchmark of the funds and the MPT benchmark that they assign to the funds according to their investment styles. The difference between these two is that the primary prospectus benchmark is the self-selected benchmark by the fund, while the MPT benchmark is assigned by Morningstar based on portfolios rather than investment strategy.[7]

We collect portfolio holdings for index funds and ETFs that physically replicate the funds' prospectus benchmarks. To construct benchmarks for the actively managed funds, we average

[6]This aggregation of share-classes to one main fund is standard in the literature using portfolio weights (see, for example, Cremers et al., 2016).

[7]The MPT benchmark is also the benchmark that Morningstar uses to compute statistics and assign ratings, which implies that the funds have incentives to outperform this as well.

the holdings across passive funds for each benchmark by security-month. In sum, the benchmark portfolios that each fund is measured against consist of the average portfolio weights held by passive funds that physically replicate the fund's prospectus benchmark. We thus prioritize using the funds' primary benchmarks when available, and when these lack coverage, we use the MPT benchmarks instead.

Voting data

Data on mutual fund voting records are obtained from the Insightia Voting database (formerly known as Proxy Insight).[8] The Insightia Voting database contains the votes of all mutual funds that are required to disclose their votes in SEC form N-PX filings. The data include votes on all agenda items in both annual shareholder meetings and special meetings. Votes cast can be "for," "against," "abstain," "withhold," or "dnv(did not vote)." For conciseness, we aggregate "against," "abstain," "withhold," and "dnv" together.[9] Apart from votes cast, the data also includes voting recommendations for each item of the agenda from both ISS and Glass Lewis, which enables us to conduct robustness checks using both proxy recommendations. In addition, the data contain voting outcomes for all agenda items.[10] Voting outcomes refer to the percentage of votes across all investors that are for, against, abstain/withhold, or broker non-votes, respectively. The agenda items are divided into six broad categories: board of directors, remuneration, committees & reporting, general governance, corporate structure, and environmental & social. The proposal is sponsored by management or by shareholders. Because the Insightia Voting database compiles voting data starting from 2012, we restrict our sample to the period of 2012 to the end of 2021.

Final sample

Finally, we merge the above data sets according to the procedure outlined in Appendix 2.B.2. The final sample is a four-dimensional data set with 27,696,867 fund-company-meeting-proposal observations. The total TNA of all the funds in our sample at the end of 2021 amounts to 8.8 USDtn. According to the Investment Company Institute, the total assets under management in US based actively managed equity mutual funds and ETFs stood at 16.7 USDtn at the end of

[8]The database is largely comparable to the ISS Voting Analytics database. This database is used in other empirical studies of shareholder voting such as Duan et al. (2021) and Boone et al. (2020).
[9]This aggregation of vote cast is standard in the shareholder voting literature (see, for example, Heath et al., 2022).
[10]Note that some voting outcomes are missing prior to 2014.

2021. As such, our sample accounts for a minimum of 53% of the assets under management.[11]

2.3.2 Descriptive statistics

Summary statistics of the main variables are presented in Table 2.3.1.[12] Panel A presents summary statistics of variables at the fund level varying over time. The funds included in our sample exhibit large variation in fund size, fund fees, fund inflow, fund turnover, fund alpha, and active share. Since we focus on actively managed funds in this study, the level of active share is relatively high with a mean of 82.31%. Panel B reports statistics of fund-company-level variables, including active weight and active votes. It shows that the distribution of active weight is right-skewed. Consistent with the idea of Anton et al. (2021), we find that most portfolio holdings deviate little from the benchmark, but fund managers often make a few large bets. Large bets typically refer to overweight because, for long-only mutual funds, the smallest portfolio weight is zero, and accordingly, the maximum size of underweight cannot exceed the benchmark weight. As a result, the maximum absolute value of underweight is 13.7%, while the maximum overweight amounts to 70%. Lastly, Panel C examines the frequency of voting against ISS on the fund-company-proposal level. The unconditional probability of voting against ISS is 7% for all votes cast by the mutual funds in our sample, while the tendency to vote against ISS on contentious items is much higher (46%), given the controversial nature of these proposals.

[11] We are not able to separate the active funds from active ETFs from the Investment Company Institute. The statistics are available at `https://www.ici.org/system/files/2022-05/2022_factbook.pdf` (last accessed on 21 December 2023).

[12] All variables are defined in Table 2.B.3 in Appendix 2.B.

Table 2.3.1.
Summary statistics I: Main variables

This table presents summary statistics of the main variables in our merged data set. Panel A: Fund-level variables in the nearest months prior to the portfolio companies' meeting dates. All fund-level variables are winsorized at the 1% and 99% percentiles. Panel B: Fund-company level variables including portfolio weight, active weight, and active votes. Active weight is a continuous variable that measures the deviation of portfolio weight from benchmark weight. Overweight is defined as a continuous variable that equals active weight when active weight is above zero, and zero otherwise. Underweight is defined as a continuous variable that equals active weight when active weight is below zero, and zero otherwise. Active votes is defined as the percentage of votes against ISS among all votes. Panel C: Fund-company-proposal level variables, namely the votes cast by each fund on each proposal of each portfolio company. Vote against ISS is a dummy variable that equals one when the vote cast by the fund is against ISS recommendation, and zero otherwise.

Panel A: Fund-year level

	N	Mean	SD	Min	P25	Median	P75	Max
log(TNA)	222,109	5.83	2.04	0.20	4.45	5.96	7.26	10.30
log(family TNA)	223,103	9.67	2.56	0.20	8.01	10.27	11.26	13.93
Expense ratio (%)	222,268	1.04	0.39	0.02	0.82	1.00	1.24	2.66
Net flow (%)	220,796	0.03	6.25	−90.24	−1.45	−0.47	0.67	99.68
Turnover (%)	219,557	64.58	79.58	0.00	27.00	47.00	79.57	3,634.00
Gross alpha (%)	221,649	0.08	1.99	−18.38	−0.81	0.05	0.94	21.29
Active share (%)	223,363	82.31	15.03	29.48	73.25	86.20	94.36	100.00

Panel B: Fund-company-year level (%)

	N	Mean	SD	Min	P25	Median	P75	Max
Portfolio weight	2,823,349	0.72	1.05	0.00	0.06	0.32	0.99	70.02
Active weight	2,823,349	0.59	0.98	−13.67	0.02	0.22	0.83	70.02
|Active weight|	2,823,349	0.62	0.96	0.00	0.04	0.25	0.85	70.02
Overweight	2,823,349	0.60	0.95	0.00	0.02	0.22	0.83	70.02
Underweight	2,823,349	−0.02	0.17	−13.67	0.00	0.00	0.00	0.00
Active votes	2,823,349	7.15	18.04	0.00	0.00	0.00	5.88	100.00
Active votes (contentious)	989,612	44.35	47.20	0.00	0.00	0.00	100.00	100.00

Panel C: Fund-company-proposal level

	N	Mean	SD	Min	P25	Median	P75	Max
Vote against ISS (all)	27,696,867	0.07	0.26	0	0	0	0	1
Vote against ISS (contentious)	2,025,794	0.46	0.50	0	0	0	1	1

Table 2.3.2 presents a more nuanced examination of the voting patterns based on the magnitude and direction of the active weights. Overweight above the median of the entire data set of portfolio holdings is labeled as large overweight, while those below the median are labeled as small overweight. The same goes for underweight, but in the opposite direction. We also differentiate between the topics of the agenda in all combinations of management recommendations and the recommendations of the ISS following Heath et al. (2022). That is, we split agenda items into two categories: (1) consensus items: items for which firm management and ISS made the same recommendation, and (2) contentious items: items for which firm management and ISS made opposing recommendations. As we can see, most agenda items are largely procedural, where management recommendation, ISS recommendation, and votes cast converge. We note that on contentious votes, there is a substantial discrepancy in the probability of voting against ISS between large overweighted companies and small overweighted companies. For items that firm management support but ISS oppose, mutual funds vote yes 47% of the time on large overweighted companies compared to 37% on small overweighted companies. The gap is much smaller between companies with large underweight and those with small underweight. This pattern provides preliminary evidence to our hypothesis that fund managers are more likely to vote actively when holding a large active weight in the company, and this behavior is mainly driven by overweighted companies.

Table 2.3.2.
Summary statistics II: Voting by active weight

This table shows the fraction of each type of vote cast by mutual funds across different types of management recommendation and ISS recommendations, based on whether the fund's overweight or underweight in the company is above or below median. Votes other than For (including Against, Abstain and Did Not Vote) are grouped under the Against category. Numbers in percentages.

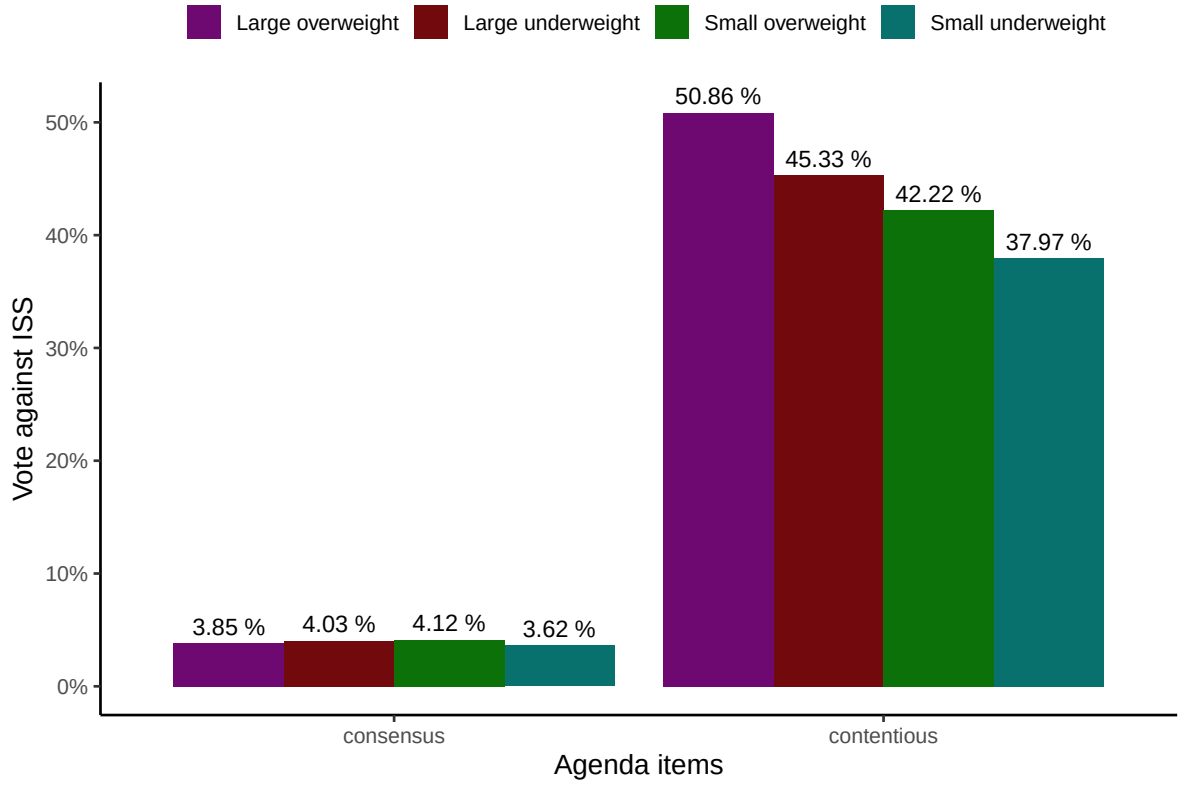
		Small overweight		Large overweight		Small underweight		Large underweight		
Mgmt. rec	ISS rec	For	Against	For	Against	For	Against	For	Against	N
All		91.35	8.65	91.60	8.40	91.38	8.62	89.50	10.50	27,696,867
Consensus										
Yes	Yes	95.93	4.07	96.28	3.72	96.41	3.59	96.18	3.82	25,375,501
No	No	6.16	93.84	7.68	92.32	4.51	95.49	6.51	93.49	296,739
Contentious										
Yes	No	**37.24**	62.76	**46.95**	53.05	32.99	67.01	36.93	63.07	1,474,856
No	Yes	51.95	48.05	48.92	51.08	53.23	46.77	49.66	50.34	549,771

For illustration purposes, we plot the percentage of active votes in each category of active weight in Figure 2.3.1. Similar to Table 2.3.2, for consensus items, the tendency to vote against

ISS is fairly even among different active weight categories. However, on contentious items, mutual funds vote most actively on companies with large overweight, and least actively on companies with small underweight. This result is in line with previous findings in the literature that mutual funds generally vote identically on consensus votes, and active voting occurs only when the ISS and management disagree (Iliev and Lowry, 2014; Heath et al., 2022). Since most of the agenda items are routine proposals (such as approving the choice of auditor), voting on contentious proposals is more likely to reflect actual monitoring efforts. Therefore, we mainly use votes cast on contentious items in our analysis hereafter.

Figure 2.3.1.
Active voting by active weight

This figure plots the percentage of active votes in each active weight category for consensus items and contentious items, respectively. Consensus items refer to proposals in which ISS recommendation agrees with management recommendation, whereas on contentious items ISS recommendation differs from management recommendation. We divide active weight relative to the benchmark for each fund-firm-year triple into four categories: large overweight (above-median overweight), large underweight (below-median underweight), small overweight (below-median overweight), and small underweight (above-median underweight). The percentage of votes against ISS recommendations in each category is plotted on the vertical axis.



2.3.3 Research design

The descriptive statistics in Section 2.3.2 reveal that active portfolio management and active ownership are closely related. To complement the non-parametric univariate results, we formally test our hypotheses in a regression framework to rule out the influence of confounders.

Specifically, we test the proportional benefit hypothesis on the fund-company level using the following specification:

$$\begin{aligned}\text{Active votes } (\%)_{j,i,t} = \alpha + \beta_1 |\text{Active weight}|_{j,i,t-1} + \beta_2 \text{Portfolio weight}_{j,i,t-1} \\ + \mathbf{X}_{j,t-1}\boldsymbol{\zeta} + \gamma_{i,t} + \mu_{j,t} + \epsilon_{j,i,t}\end{aligned} \tag{2.3}$$

where subscript j denotes the fund, i the company and t the meeting date. $\mu_{j,t}$ and $\gamma_{i,t}$ represent the fund-year and firm-year fixed effects, respectively. In this specification, the dependent variable, Active votes (%), is the percentage of active votes on contentious items at the fund-company level, i.e., a fund's proportion of votes against ISS on contentious items at the meeting of each portfolio company. The main explanatory variable of interest is |Active weight|, that is, the absolute active weight in the month closest to the meeting date. Control variables are reported monthly, so there is still variation within each fund×year. Furthermore, the control variables in $\mathbf{X}$ are collected from the month nearest to the meeting. Importantly, we also control for a fund's portfolio weight in the firm in the fund-company-date dimension (Iliev and Lowry, 2014; Fich et al., 2015), so β_1 captures the effect of deviating from the benchmark on active votes, holding the actual portfolio weight constant.

However, given the large variety of agenda items on a company's ballot, the nature of proposals could also affect mutual fund voting decisions. To further control for the proposal characteristics, we conduct a three-dimensional analysis at the fund-company-proposal level. For each fund j voting in a shareholder meeting of a portfolio firm i on proposal p at time t, we estimate the following specification:

$$\begin{aligned}\text{Vote against ISS}_{j,i,t,p} = \alpha + \beta_1 |\text{Active weight}|_{j,i,t-1} + \beta_2 \text{Portfolio weight}_{j,i,t-1} \\ + \mathbf{X}_{j,t-1}\boldsymbol{\zeta} + \rho_p + \mu_{j,t} + \epsilon_{j,i,t,p}\end{aligned} \tag{2.4}$$

Here, our dependent variable is Vote against ISS, a dummy variable that equals one if fund j votes against ISS recommendation on proposal p of firm i in time t, and zero otherwise. Similar

to Equation (2.3), the explanatory variables are collected from the nearest month before the meeting date. The richness and the multilevel structure of the data allow us to include both proposal fixed effects (ρ_p) and fund-year fixed effects ($\mu_{j,t}$), which greatly alleviates omitted variable bias and addresses related endogeneity concerns.

Our research design attempts to address three elements of endogeneity when studying the effect of active weight on active voting. First, active weight is endogenous to the unobservable financial factors that induce fund managers to vote in a certain way, such as firm profitability and CEO reputation (David et al., 2023). For example, Ertimur et al. (2013) show that firm performance strongly affects not only the voting recommendations of proxy advisors but also the votes cast by mutual funds. At the same time, firm performance is also an important determinant of how fund managers select and weight portfolio firms. Second, active vote is related to a host of economic factors that determine the costs and benefits of casting informed votes, including fund location, fund turnover, and fund size, among others (Iliev and Lowry, 2014). Fund managers' inherent skills affect both portfolio construction and active ownership strategies. Third, there is cross-sectional variation in the quality of proposals (Gantchev and Giannetti, 2020), which could impact shareholder voting.

In order to address these endogeneity concerns, we include three sets of fixed effects. The first is a firm-year fixed effect, which controls for the unobservable firm characteristics that equally affect all funds' voting on firm i in time t (e.g., firm profitability, board structure, and CEO skills). The second fixed effect imposed is at the fund-year level. This controls for the unobservable fund characteristics that affect active voting equally for all firms voted by fund j in time t (e.g., fund location and fund manager). The third is a proposal fixed effect, which controls for the nature and timing of each proposal that affect all funds voting on the proposal. The proposal fixed effect is based on a unique ID in the Insightia Voting database that is linked to each individual proposal of firm i in time t. Therefore, the proposal fixed effect subsumes firm-year fixed effect.

As shown in Equation (2.1), the relative returns of a fund can be decomposed into contribution from single securities. Accordingly, the incentives to monitor may vary within a fund's portfolio depending on the active weight of the company. Because fund j votes multiple companies in a given year, the use of a fund-time fixed effect compares the same fund's vote for firm i_1 with that of their vote for firm i_2 in time t. Similarly, the same firm i is owned and voted by many funds in year t. The use of firm-year fixed effects compares the same firm's active weights across fund j_1's portfolio and fund j_2's portfolio in time t. When both firm-year fixed effect and fund-year

fixed effect are included in one model, the interpretation of the results is both within-fund and within-firm in year t. When we include both proposal fixed effect and fund-year fixed effect, the result measures the effect of active weight for a given fund-year on voting a particular proposal.

2.4 Results

2.4.1 Proportional benefit hypothesis

This section tests the proportional benefit hypothesis by examining the relation between the size of a company's active weight in a fund and the fund's active voting at the annual meetings of that company. Since the contribution of active voting to fund alpha is proportional to the size of active weight, we expect fund managers to vote more actively in the companies where they hold larger active weights. To begin with, we measure the size of active weight using the absolute value of active weight, which represents the magnitude of the portfolio weight's deviation from the benchmark weight, irrespective of being overweight or underweight.

Table 2.4.1 reports our main results. We find a consistently positive and statistically significant coefficient on absolute active weight across all specifications. In Column (1) with only firm-year fixed effects, we utilize within-company cross-fund variation and test whether funds with larger active weights in a company vote more actively than funds with smaller active weights in the same company in the same meeting. While we control for observable fund characteristics, it is possible that unobservable fund-level heterogeneity could be driving the results. We add fund fixed effects in Column (2) to control for unobserved variables that are fixed over time, such as fund location and fund managers' inherent skills. Here, we exploit the variation in active weight across funds within a given company at a given time and the variation in active weight across firms within a given fund. The coefficient on absolute active weight decreases, but remains statistically significant. The coefficients in Column (3) are largely comparable to those in Column (2), which is not surprising since we already control for many observable time-varying fund characteristics. We see a similar pattern in Column (4) to Column (6).

Our most saturated specification, reported in Column (6), produces a coefficient of 0.242 significant at the 1% level for the continuous measure of absolute active weight. It means that mutual funds are more likely to vote against ISS on contentious agenda items when the company is weighted differently in the fund portfolio than in the benchmark portfolio. More precisely, on average, a 1% increase in active weight results in an increase of 0.24 percentage

points in the probability of voting against ISS on contentious proposals, after controlling for time-varying fund characteristics and proposal characteristics. As shown by Anton et al. (2021), fund managers typically only have in-depth knowledge of their top ten positions ("best ideas"). It can be expected that fund managers' engagement efforts are mostly allocated to these companies. In our sample, the average active weight of the best ideas in a portfolio is 14.1%. Therefore, being selected as the top ten stocks by a fund manager increases the likelihood of active voting by 3.4%. It corresponds to approximately 7% of the unconditional average propensity to vote against ISS on contentious items of 46%. As absolute active weight in theory ranges from zero to 100%, the largest possible active bet could generate a substantial impact on the fund's vote. We cluster standard errors by company and meeting date since mutual fund voting decisions at a given company meeting are likely to be correlated due to peer effects (Matvos and Ostrovsky, 2010; Huang, 2023). However, the results remain unchanged when standard errors are clustered by fund and year or by fund and company.

A potential concern with our results is that the relationship between active weight and the probability of voting against ISS may not be linear. To alleviate concerns about functional forms, we divide active weight into quartiles and create dummy variables for the different categories. The first quartile is used as a baseline. The results are reported in Table 2.4.2. In general, the coefficients gradually increase from the second to the fourth quartile, indicating a higher probability of voting against ISS when active weight increases.

Table 2.4.1.
Active ownership and absolute active weight

The table presents OLS estimates in a sample that consists of all the votes cast by US-based actively managed mutual funds on contentious agenda items in 2012-2021. Contentious votes refer to agenda items where ISS recommendation differs from management recommendation. |Active weight| is the absolute value of active weight, representing the deviation of portfolio weight from benchmark weight. In Column (1) to (3), the dependent variable is Active vote (%) for each fund-company-meeting date observation, defined as the proportion of votes against ISS out of all the company's contentious agenda items the fund has voted on. In Column (4) to (6), Vote against ISS is a dummy variable on the fund-company-meeting date-proposal level that equals one if the vote cast differs from ISS recommendation, and zero otherwise. The control variables are measured in the nearest month prior to the meeting date. Robust standard errors clustered by company and meeting date are shown in parentheses. Asterisks denote statistical significance: $^{***}p<1\%$, $^{**}p<5\%$, $^{*}p<10\%$.

	Active vote (%)			**Vote against ISS**		
	(1)	(2)	(3)	(4)	(5)	(6)
|Active Weight|	1.68***	0.427***	0.441***	1.67***	0.231**	0.242***
	(0.220)	(0.108)	(0.108)	(0.180)	(0.099)	(0.087)
Portfolio weight	0.379*	0.489***	0.446***	0.162	0.494***	0.455***
	(0.205)	(0.101)	(0.101)	(0.174)	(0.088)	(0.082)
log(TNA)	1.21***	-0.835***	-1.28***	0.011***	-0.008***	-0.008**
	(0.029)	(0.090)	(0.406)	(0.0003)	(0.001)	(0.004)
log(Family TNA)	1.16***	3.25***	0.271	0.011***	0.024***	0.008
	(0.041)	(0.214)	(1.30)	(0.0005)	(0.002)	(0.014)
Expense ratio	-3.40***	-2.81***	-2.85**	-2.54***	-2.67***	-2.47*
	(0.161)	(0.401)	(1.41)	(0.178)	(0.456)	(1.48)
Net flow	-0.064***	0.016**	0.002	-0.051***	0.018**	-0.006
	(0.008)	(0.007)	(0.008)	(0.009)	(0.008)	(0.008)
Turnover	-0.003***	-0.0004	-0.008	-0.003***	-0.0008	0.003
	(0.0009)	(0.001)	(0.007)	(0.001)	(0.002)	(0.007)
Active share	0.253***	-0.005	0.027**	0.226***	-0.005	0.023*
	(0.004)	(0.008)	(0.012)	(0.004)	(0.009)	(0.013)
Gross alpha	0.250***	0.050*	0.063*	0.192***	0.013	0.030
	(0.039)	(0.030)	(0.034)	(0.046)	(0.031)	(0.034)
Firm×Year FE	Yes	Yes	Yes	No	No	No
Fund FE	No	Yes	No	No	Yes	No
Fund×Year FE	No	No	Yes	No	No	Yes
Proposal FE	No	No	No	Yes	Yes	Yes
Observations	949,954	949,954	949,954	1,946,656	1,946,656	1,946,656
Adjusted R^2	0.275	0.548	0.599	0.312	0.536	0.580

Table 2.4.2.
Active ownership and absolute active weight in quartiles

The table presents OLS estimates in a sample that consists of all the votes cast by US-based actively managed mutual funds on contentious agenda items in 2012-2021. Contentious votes refer to agenda items where ISS recommendation differs from management recommendation. Q2(|Active Weight|), Q3(|Active Weight|), and Q4(|Active Weight|) are dummy variables that identify the second, third, and fourth quartile of absolute active weight, respectively. In Column (1) to (3), the dependent variable is Active Votes for each fund-company-meeting date observation, defined as the proportion of votes against ISS out of all the company's contentious agenda items the fund has voted on. In Column (4) to (6), Vote against ISS is a dummy variable on the fund-company-meeting date-proposal level that equals one if the vote cast differs from ISS recommendation, and zero otherwise. The control variables are measured in the nearest month prior to the meeting date. Robust standard errors clustered by company and meeting date are shown in parentheses. Asterisks denote statistical significance: $^{***}p<1\%$, $^{**}p<5\%$, $^{*}p<10\%$.

	Active Vote (%)			**Vote against ISS**		
	(1)	(2)	(3)	(4)	(5)	(6)
Q2(|Active weight|)	4.27***	1.55***	1.52***	0.041***	0.014***	0.014***
	(0.158)	(0.146)	(0.142)	(0.002)	(0.002)	(0.002)
Q3(|Active weight|)	3.33***	1.94***	1.94***	0.033***	0.016***	0.016***
	(0.188)	(0.178)	(0.175)	(0.002)	(0.002)	(0.002)
Q4(|Active weight|)	2.13***	2.68***	2.64***	0.028***	0.023***	0.022***
	(0.255)	(0.224)	(0.220)	(0.003)	(0.002)	(0.002)
Portfolio weight	2.10***	0.658***	0.630***	1.65***	0.549***	0.523***
	(0.094)	(0.060)	(0.060)	(0.121)	(0.060)	(0.058)
log(TNA)	1.25***	-0.821***	-1.26***	0.012***	-0.008***	-0.008**
	(0.029)	(0.089)	(0.406)	(0.0004)	(0.001)	(0.004)
log(Family TNA)	1.10***	3.24***	0.272	0.011***	0.024***	0.008
	(0.041)	(0.214)	(1.30)	(0.0005)	(0.002)	(0.014)
Expense ratio	-3.70***	-2.85***	-2.83**	-2.86***	-2.69***	-2.47*
	(0.162)	(0.401)	(1.41)	(0.180)	(0.456)	(1.48)
Net flow	-0.063***	0.017**	0.002	-0.050***	0.019**	-0.005
	(0.008)	(0.007)	(0.008)	(0.009)	(0.008)	(0.008)
Turnover	-0.004***	-0.0005	-0.009	-0.004***	-0.0008	0.003
	(0.0009)	(0.001)	(0.007)	(0.001)	(0.002)	(0.007)
Active share	0.244***	-0.011	0.027**	0.218***	-0.010	0.024*
	(0.004)	(0.008)	(0.012)	(0.004)	(0.009)	(0.013)
Gross alpha	0.247***	0.050*	0.063*	0.190***	0.014	0.031
	(0.039)	(0.029)	(0.034)	(0.047)	(0.031)	(0.034)
Firm×Year FE	Yes	Yes	Yes	No	No	No
Fund FE	No	Yes	No	No	Yes	No
Fund×Year FE	No	No	Yes	No	No	Yes
Proposal FE	No	No	No	Yes	Yes	Yes
Observations	949,954	949,954	949,954	1,946,656	1,946,656	1,946,656
Adjusted R^2	0.275	0.548	0.600	0.312	0.536	0.580

2.4.2 Asymmetric benefit hypothesis

The section above shows that fund managers are more likely to vote actively on companies whose portfolio weight deviate from benchmark weight, regardless of the direction of deviation. However, these results mask some significant distinction between the overweight and underweight cases. The univariate results in Table 2.3.2 indicate a noticeable discrepancy in active voting behavior among overweight and underweight companies. As explained in Appendix 2.B, fund managers tend to exit completely from a company if they are unhappy with company performance or disagree with company management, instead of holding an underweight in the company and actively monitoring it. In contrast, heavily overweighted companies represent the fund manager's best bets, and naturally elicit higher incentives to engage.

In the asymmetric benefit hypothesis, we are interested in how the effect of active weight varies as the incentives for voting on overweighted companies versus underweighted companies differ, so we split active weight into two continuous variables: overweight and underweight. The summary statistics for these two variables are presented in Table 2.3.1.

When we decompose active weight into overweight and underweight in Table 2.4.3, it appears that the result is mainly driven by overweights. The coefficient on overweight remains positive and significant at the 1% level. Moreover, with the same model specification, the magnitude of the overweight coefficient in Column (6) of Table 2.4.3 is more than twice the magnitude of the coefficient on |Active weight| in Column (6) of Table 2.4.1. On the contrary, the coefficient on underweight is largely negative and significant at the 10% level, although this effect is weaker than the effect on overweight. It suggests that when a mutual fund maintains a smaller portfolio weight in the company relative to the fund's benchmark, the fund manager has incentives to vote in a way that may reduce firm value. This explanation appears counterintuitive at first sight, but from the perspective of generating fund alpha, a lower stock return for an underweighted security is associated with higher relative performance for the fund (see Equation 2.2). Overall, this finding is consistent with our main results, which focus on the absolute deviation of the portfolio weight in comparison with the benchmark weight.

Table 2.4.3.
Active ownership and overweight versus underweight

The table presents OLS estimates in a sample that consists of all the votes cast by US-based actively managed mutual funds on contentious agenda items in 2012-2021. Contentious votes refer to agenda items where ISS recommendation differs from management recommendation. Overweight is defined as a continuous variable that equals active weight when active weight is above zero, and zero otherwise. Underweight is defined as a continuous variable that equals active weight when active weight is below zero, and zero otherwise. In Column (1) to (3), the dependent variable is Active Votes for each fund-company-meeting date observation, defined as the proportion of votes against ISS out of all the company's contentious agenda items the fund has voted on. In Column (4) to (6), Vote against ISS is a dummy variable on the fund-company-meeting date-proposal level that equals one if the vote cast differs from ISS recommendation, and zero otherwise. The control variables are measured in the nearest month prior to the meeting date. Robust standard errors clustered by company and meeting date are shown in parentheses. Asterisks denote statistical significance: $^{***}p<1\%$, $^{**}p<5\%$, $^{*}p<10\%$.

	Active Vote (%)			**Vote against ISS**		
	(1)	(2)	(3)	(4)	(5)	(6)
Overweight	3.18***	0.715***	0.728***	3.12***	0.547***	0.566***
	(0.195)	(0.152)	(0.157)	(0.211)	(0.153)	(0.143)
Underweight	-0.593***	0.039	0.056	-0.995***	-0.271*	-0.258*
	(0.192)	(0.159)	(0.151)	(0.233)	(0.140)	(0.132)
Portfolio weight	-1.06***	0.217	0.175	-1.25***	0.191	0.146
	(0.184)	(0.142)	(0.146)	(0.198)	(0.140)	(0.130)
log(TNA)	1.21***	-0.835***	-1.28***	0.011***	-0.008***	-0.008**
	(0.029)	(0.090)	(0.406)	(0.0003)	(0.001)	(0.004)
log(Family TNA)	1.17***	3.25***	0.272	0.012***	0.024***	0.008
	(0.041)	(0.214)	(1.30)	(0.0005)	(0.002)	(0.014)
Expense ratio	-3.35***	-2.81***	-2.85**	-2.48***	-2.67***	-2.47*
	(0.161)	(0.401)	(1.41)	(0.178)	(0.456)	(1.48)
Net flow	-0.063***	0.016**	0.002	-0.050***	0.018**	-0.006
	(0.008)	(0.007)	(0.008)	(0.009)	(0.008)	(0.008)
Turnover	-0.003***	-0.0004	-0.008	-0.003***	-0.0008	0.003
	(0.0009)	(0.001)	(0.007)	(0.001)	(0.002)	(0.007)
Active share	0.249***	-0.005	0.027**	0.222***	-0.006	0.023*
	(0.004)	(0.008)	(0.012)	(0.004)	(0.009)	(0.013)
Gross alpha	0.252***	0.050*	0.063*	0.192***	0.012	0.031
	(0.039)	(0.030)	(0.034)	(0.046)	(0.031)	(0.034)
Firm×Year FE	Yes	Yes	Yes	No	No	No
Fund FE	No	Yes	No	No	Yes	No
Fund×Year FE	No	No	Yes	No	No	Yes
Proposal FE	No	No	No	Yes	Yes	Yes
Observations	949,954	949,954	949,954	1,946,656	1,946,656	1,946,656
Adjusted R^2	0.275	0.548	0.599	0.312	0.536	0.580

2.4.3 Additional analysis

Management proposals

Our results so far treat all contentious agenda items equally, but in reality some proposals are more important than others. Proposals at annual shareholder meetings are sponsored by management or shareholders. In general, shareholder proposals receive less voting support and are less likely to be implemented by management. According to Gantchev and Giannetti (2020), less than 20% of shareholder proposals pass by a majority and only 12% is actually implemented. Furthermore, they show that a large proportion of individual shareholder proposals are low quality and actually destroy shareholder value. It is therefore reasonable to expect mutual funds to pay less attention to shareholder proposals when resources are finite. We hypothesize that the effect of active weights on active voting is stronger for management proposals (relative to shareholder proposals).

To test this hypothesis, we use the following difference-in-differences design that allows for stronger identification:

$$\begin{aligned}\text{Vote against ISS}_{j,i,t,p} =& \alpha + \beta_1 |\text{Active weight}|_{j,i,t} + \beta_2 \text{Portfolio weight}_{j,i,t} + \beta_3 \text{Management}_{i,p,t} \\ &+ \beta_4 |\text{Active weight}|_{j,i,t} \times \text{Management}_{i,p,t} + \delta_{j,i,t} + \pi_p + \epsilon_{j,i,t,p}.\end{aligned} \tag{2.5}$$

Management is a dummy variable that is equal to one if the proposal is sponsored by management and zero if it is sponsored by shareholders. We include fund×firm×year fixed effects ($\delta_{j,i,t}$) and proposal type fixed effects (π_p). We are mainly interested in the interaction between management proposals and active weight. Here, β_4 measure the difference in the effect of active weight between management proposals and shareholder proposals for a given firm×fund×year triple on voting in all contentious proposals. The inclusion of firm×fund×year fixed effects further alleviates concerns about omitted variable bias, since it controls for business ties and other connections between mutual funds and portfolio firms, which are known to affect mutual fund voting decisions (Cvijanovic et al., 2016; Calluzzo and Kedia, 2019; Butler and Gurun, 2012).

Contested proposals

Another source of heterogeneity stems from the level of contestedness in voting. Previous studies highlight the special role of contested proposals, that is, proposals that pass or fail by a narrow margin (Bach and Metzger, 2018; Brav et al., 2022a; Michaely et al., 2022). In such cases, it is hard for investors to predict voting outcomes, and a fund's vote is more likely to be pivotal. The passage of contested votes is also more likely to be value-enhancing because, in such cases, the voting outcome is not fully anticipated by the market. That is, the incentives to cast an informed vote in order to enhance fund performance are even higher if the proposal is contested. Therefore, we hypothesize that the effect of active weights on active voting is stronger for contested proposals. We test this hypothesis using a difference-in-differences design similar to Equation (2.5), but substitute the variable Management with the variable Contested, which is defined as a dummy variable equal to one when the percentage of votes in favor of that proposal is within the range of 40% to 60%, and zero otherwise.

ES proposals

With the increase in environmental, social and governance (ESG) investing in the past decade, the role of environmental & social (ES) proposals in shareholder voting has gained increasing attention from scholars. He et al. (2023) find that collectively mutual funds' votes on these proposals contain important information about the companies' ES risks. Furthermore, ES proposals are generally characterized by a high ISS support rate and a low management rate. In our sample, out of the 4,442 ES proposals in our sample, ISS recommends voting for 67% of them, while management only supports 47%.

However, there are considerable nuances with regard to the votes of different mutual funds on these issues. In particular, Michaely et al. (2022) find that ES funds in non-ES families only support ES proposals with a low probability of passing, while opposing them when their votes are pivotal. Because not all ES proposals are financially material (Grewal et al., 2016), voting these proposals also reflects investors' non-financial preferences, which are well documented (Hartzmark and Sussman, 2019; Bauer et al., 2021). If the non-financial motives regarding ES performance exceed the financial incentives of higher fund alpha, it can be expected that fund managers are more likely to vote for ES proposals when there is a conflict. That is to say, the financial incentives to vote against ISS on ES proposals of overweighted companies are possibly diluted by non-financial motives. Again, we use the regression framework in Equation (2.5) to

test our hypothesis. We rely on the proposal categorization in the Insightia Voting database to identify ES proposals.

Results: proposal heterogeneity

The results on the heterogeneity of the proposals are reported in Table 2.4.4. The coefficient of the interaction term between the management proposals and the absolute active weight is positive and statistically significant at the 1% level. The estimate in Column (2) suggests that a one-percentage-point increase in absolute active weight leads to approximately a 1.5 percentage points increase (relative to shareholder proposals) in the probability of voting against ISS for management proposals. In Column (4), the coefficient on the interaction term is 0.758, indicating that a one-percentage-point increase in absolute active weight has a differential effect on contested proposals relative to non-contested proposals of increasing the probability of voting against ISS by approximately 0.8 percentage points. The magnitude of this effect is sufficiently large to change the final voting outcome of a contested proposal. In contrast, the coefficient on the interaction term between the ES proposals and the absolute active weight is negative and statistically insignificant. It suggests that an increase in active weight does not induce a higher probability of active voting on ES proposals, compared to governance proposals.

In total, the results reveal substantial heterogeneity between different types of proposal, indicating the need to differentiate between agenda items when considering the incentives to engage.

Table 2.4.4.
Heterogeneous effects based on proposal type

The table presents OLS regression estimates of how active weight affects fund's voting on contentious proposals sponsored by firm management, contentious proposals contested at the 10% level, and contentious ES proposals, using a difference-in-differences design. The regression with the Contested variable is run over all contentious proposals with available data on voting outcomes. Each observation represents the vote of a mutual fund on a proposal at a company's shareholder meeting. The dependent variable equals one if the fund votes against ISS recommendation or zero, otherwise. The main independent variable is the interaction term between a dummy variable for a specific type of proposal and the fund's active weight in a firm relative to the benchmark. The coefficient on ES proposal in Column (6) is dropped due to collinearity and hence not reported. Standard errors clustered by fund and firm are shown in parentheses.*p<.1; **p<.05; ***p<.01.

	Vote against ISS					
	(1)	(2)	(3)	(4)	(5)	(6)
Management×|Active Weight|	1.59***	1.45***				
	(0.503)	(0.500)				
Management	0.054***	0.046**				
	(0.020)	(0.020)				
Contested×|Active Weight|			0.699*	0.758**		
			(0.359)	(0.375)		
Contested			-0.135***	-0.105***		
			(0.012)	(0.012)		
ES proposal×|Active Weight|					-0.585	-0.508
					(0.459)	(0.489)
ES proposal					0.114***	
					(0.014)	
|Active Weight|	8.52	-1.66	6.70	-8.27	10.2	-0.140
	(6.83)	(8.48)	(9.53)	(13.9)	(7.88)	(9.28)
Portfolio weight	-9.70	1.65	-7.28	7.84	-9.36	1.59
	(6.84)	(8.61)	(9.74)	(14.6)	(7.95)	(9.47)
Fund×Firm×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Proposal Type FE	No	Yes	No	Yes	No	Yes
Observations	2,025,792	2,004,577	1,547,874	1,540,680	2,004,579	2,004,579
Adjusted R^2	0.819	0.827	0.813	0.822	0.820	0.826

2.4.4 Robustness checks

NBIM votes

Recent research suggests that voting against ISS is not always a perfect signal of active monitoring because proxy advisors' recommendations might be biased against management (Malenko et al., 2023). Instead, theory predicts that the votes of institutional investors managing large portfolios will be informed and unbiased in equilibrium. Thus, it can be informative to benchmark the incentives of mutual funds against those of direct shareholders (Brav et al., 2022b).

We use the votes of Norges Bank Investment Management (NBIM), the world's largest sovereign wealth fund, as an alternative benchmark in this study. As a universal owner and a direct shareholder, NBIM enjoys all the benefits of active engagement and does not suffer from the free-rider problem. NBIM is an active voter that not only publishes a database containing all of its historical votes since 2013, but also publicly discloses its voting intentions 5 days prior to the company meeting.[13] By pre-disclosing its votes, NBIM aims to promote high standards of corporate governance and encourage other shareholders to consider its well-conducted research. Fahlenbrach et al. (2023) estimate that, on average, NBIM's pre-disclosure of vote against a proposal leads to an increase of 2.7 percentage points in opposition by other shareholders.

It is particularly interesting to examine proposals where NBIM vote differs from ISS recommendation. This divergence can be viewed as an alternative definition of contentious proposal. In this case, voting against ISS entails following NBIM, a signal of informed voting. As a robustness check, we run the regression in Equation (2.4) on this sub-sample. The results presented in Table 2.4.5 are similar to our main results. Mutual funds are more likely to vote in line with NBIM when they place higher active weights in the company, especially for overweighted companies.

[13]The vote records are available at `https://www.nbim.no/en/responsible-investment/voting/our-voting-records/` (last accessed on 21 December 2023).

Table 2.4.5.
Robustness check: Voting with NBIM

The table presents OLS regression estimates of how active weight affects the fund's voting. The sample consists of all the proposals where NBIM vote differs from ISS recommendation. Each observation represents the vote of a mutual fund on a proposal at a company's shareholder meeting. The dependent variable equals one if the fund votes with NBIM (ie., vote against ISS in this case), or zero otherwise. The main independent variables are the fund's active weight in a firm relative to the benchmark and the fund's actual portfolio weight in a firm. Column (1) to (3) examine active weight as a continuous variable. In Column (4), active weight is split into two continuous variables, overweight and underweight, respectively. In Column (5), active weight is divided into quartiles represented by dummy variables. Each year for each fund we divide the portfolio companies into quintiles based on the company's absolute active weight within the fund's portfolio. Robust standard errors clustered by fund and firm are shown in parentheses. Asterisks denote statistical significance: $^{***}p<1\%$, $^{**}p<5\%$, $^{*}p<10\%$.

	Vote with NBIM				
	(1)	(2)	(3)	(4)	(5)
|Active Weight|	1.63***	0.300	0.362		
	(0.296)	(0.239)	(0.231)		
Overweight				0.677**	
				(0.322)	
Underweight				-0.715	
				(0.482)	
Q2(|Active Weight|)					0.002
					(0.002)
Q3(|Active Weight|)					0.006***
					(0.002)
Q4(|Active Weight|)					0.009***
					(0.002)
Portfolio weight	-0.827***	0.201	0.122	-0.189	0.225**
	(0.288)	(0.221)	(0.218)	(0.311)	(0.101)
log(TNA)	0.005***	-0.001	-0.023***	-0.023***	-0.023***
	(0.0005)	(0.002)	(0.006)	(0.006)	(0.006)
log(Family TNA)	0.005***	-0.005	0.053**	0.052**	0.053**
	(0.0007)	(0.006)	(0.025)	(0.025)	(0.026)
Expense ratio	-2.23***	-0.674	0.079	0.065	0.083
	(0.236)	(1.01)	(2.39)	(2.39)	(2.39)
Net flow	0.028**	0.027***	0.025**	0.025**	0.025**
	(0.011)	(0.010)	(0.012)	(0.012)	(0.012)
Turnover	0.003**	0.002	0.015	0.015	0.015
	(0.001)	(0.003)	(0.012)	(0.012)	(0.012)
Active share	0.143***	0.027*	0.012	0.011	0.012
	(0.006)	(0.014)	(0.018)	(0.018)	(0.018)
Gross alpha	-0.036	0.008	0.078	0.077	0.078
	(0.062)	(0.049)	(0.052)	(0.052)	(0.052)
Proposal FE	Yes	Yes	Yes	Yes	Yes
Fund FE	No	Yes	No	No	No
Fund×Year FE	No	No	Yes	Yes	Yes
Observations	598,186	598,186	598,186	598,186	598,186
Adjusted R^2	0.506	0.608	0.623	0.623	0.623

ISS vs. Glass Lewis

Although ISS has the largest share of the proxy advisory market, it is possible that some of the mutual funds in our sample subscribe to other proxy advisors such as Glass Lewis. In particular, Shu (2022) shows that the proxy advice market has become less concentrated over the past decade, with ISS gradually losing market share to Glass Lewis and other smaller proxy advisors. As of 2017, ISS controlled 63% of the mutual funds market in the US and Glass Lewis controlled 28%. Using ISS recommendation as a benchmark for active voting may not capture robo-voting behavior for fund managers that subscribe to other proxy advisors. Therefore, we use the voting recommendations of both ISS and Glass Lewis as an alternative benchmark in this study. We restrict the sample to the proposals where there is data on both ISS and Glass Lewis recommendation.[14] Out of all the proposals where both ISS recommendation and Glass Lewis recommendation are available in our sample, the two biggest proxy advisors disagree on 8.9% of the proposals.

The dependent variable, Vote against ISS and GL, measures the intensity of active voting against proxy advisors. Three voting possibilities have been coded into ordered levels of activeness as follows: Vote against neither ISS nor Glass Lewis = 0, Vote against either ISS or Glass Lewis = 0.5; and Vote against both ISS and Glass Lewis = 1. This classification reflects varying levels of activeness, providing a more refined classification scheme than is possible with the binary coding of voting against ISS.

Table 2.4.6 presents the results of the robustness check. In line with our main results, the coefficient on |Active weight| is positive and statistically significant. The effects of different quartiles of active weight are also similar to those in Table 2.4.2. Moreover, the asymmetric effects of overweight and underweight continue to hold in this setting. Overall, these results show that our findings are robust to the choice of proxy advisors as the voting benchmark.

[14]The Insightia Voting database include voting recommendations from both ISS and Glass Lewis. Where Insightia does not have an adviser's true recommendation available, it uses a proprietary method to calculate what an adviser's recommendation was by analyzing investor votes. The availability of ISS recommendation is wider than Glass Lewis recommendation in the database, possibly due to ISS's large market share.

Table 2.4.6.
Robustness check: Voting against ISS and Glass Lewis

The table presents OLS regression estimates of how active weight affects fund's voting. The sample consists of all the votes on contentious items cast by U.S. mutual funds in 2012-2021. Contentious items refer to agenda items where ISS recommendation differs from management recommendation. Each observation represents the vote of a mutual fund on a proposal at a company's shareholder meeting. The dependent variable equals one if the fund votes against both ISS and Glass Lewis recommendations, or 0.5 if the fund votes against either ISS or Glass Lewis, or zero otherwise. The main independent variables are the fund's active weight in a firm relative to the benchmark and the fund's actual portfolio weight in a firm. Column (1) to (3) examine active weight as a continuous variable. In Column (4), active weight is split into two continuous variables, overweight and underweight, respectively. In Column (5), active weight is divided into quartiles represented by dummy variables. Each year for each fund we divide the portfolio companies into quintiles based on the company's absolute active weight within the fund's portfolio. Robust standard errors clustered by fund and firm are shown in parentheses. Asterisks denote statistical significance: $^{***}p<1\%$, $^{**}p<5\%$, $^{*}p<10\%$.

	Vote against both ISS and GL				
	(1)	(2)	(3)	(4)	(5)
|Active Weight|	1.08***	0.204**	0.228***		
	(0.108)	(0.079)	(0.079)		
Overweight				0.432***	
				(0.128)	
Underweight				-0.066	
				(0.127)	
Q2(|Active Weight|)					0.0007
					(0.0009)
Q3(|Active Weight|)					0.002**
					(0.001)
Q4(|Active Weight|)					0.007***
					(0.001)
Portfolio weight	0.070	0.226***	0.201***	0.007	0.248***
	(0.093)	(0.070)	(0.070)	(0.109)	(0.059)
log(TNA)	0.006***	-0.002**	-0.002	-0.002	-0.002
	(0.0003)	(0.0008)	(0.003)	(0.003)	(0.003)
log(Family TNA)	0.004***	0.011***	-0.014	-0.014	-0.014
	(0.0004)	(0.002)	(0.011)	(0.011)	(0.011)
Expense ratio	-2.14***	0.257	-0.191	-0.188	-0.204
	(0.135)	(0.364)	(1.18)	(1.18)	(1.18)
Net flow	-0.032***	-0.010	-0.008	-0.008	-0.008
	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)
Turnover	-0.0003	-0.001	-0.0003	-0.0003	-0.0004
	(0.0007)	(0.001)	(0.007)	(0.007)	(0.007)
Active share	0.117***	-0.010	-0.012	-0.013	-0.013
	(0.003)	(0.008)	(0.011)	(0.011)	(0.011)
Gross alpha	0.165***	0.054*	0.014	0.014	0.014
	(0.037)	(0.030)	(0.034)	(0.034)	(0.034)
Proposal FE	Yes	Yes	Yes	Yes	Yes
Fund FE	No	Yes	No	No	No
Fund×Year FE	No	No	Yes	Yes	Yes
Observations	1,384,490	1,384,490	1,384,490	1,384,490	1,384,490
Adjusted R^2	0.268	0.395	0.435	0.435	0.435

2.5 Conclusion

Interest in shareholder activism and voting activity is on the rise, raising questions about the role of institutional investors.[15] Mutual funds constitute a significant share of public company ownership and therefore play a crucial role in the corporate governance of their portfolio companies.[16] Making informed voting decisions involves costs associated with acquiring information about portfolio companies, and the potential benefits of active ownership are distributed among all shareholders. As an alternative to gathering information about portfolio companies, shareholders can choose to purchase this service from proxy advisors. Following the advice of proxy advisors can be considered as the least costly way to meet the regulatory requirements in proxy voting. Consequently, fund managers must carefully consider the potential advantages of collecting information to vote in an informed manner against the costs of conducting independent research.

This paper investigates whether the incentives to engage derived from chasing fund alpha are determined by the active weights of portfolio companies. Such incentives exist at both the asset management company level and the fund manager level. Lewellen and Lewellen (2022) propose that the income of the company can increase from both subsequent flows after high performance and when the portfolio companies increase in value. Moreover, the fund manager has incentives to improve performance to collect higher performance-based bonuses (Ma et al., 2019).

We highlight three main findings of our study. First, the deviation of a company's portfolio weight from benchmark weight significantly increases the probability of voting against ISS recommendation, and this increase is non-linear and mainly driven by the fourth quartile in the size of active weight. Second, mutual funds primarily use active voting to monitor overweighted companies, whereas companies with zero portfolio weight in the fund (although benchmark weight is above zero), which do not bestow voting rights, comprise the majority of underweight cases. Third, the effect of active weights on the likelihood of voting against ISS is more salient for management proposals and contested votes. We believe that our results provide robust evidence that mutual fund managers utilize active ownership as a means to improve funds' relative performance.

Our findings imply that incentives to outperform the benchmark can mitigate the free-rider problem when the potential net benefit of active voting is sufficiently large. However, the

[15] For an overview on institutional investors and corporate governance, see Dasgupta et al. (2021).

[16] As of 2022, mutual funds collectively own approximately 32% of all publicly traded companies in the U.S. (Investment Company Institute, 2022).

asymmetry in how the potential net benefit affects active voting in under- and overweighted companies suggest that free-riding is more pronounced when holding an underweight with voting rights. This is consistent with the notion that underweighted stocks only contributes positively to gross alpha if the value of the companies decrease. This relative performance-based objective applies predominantly to active funds rather than passive funds. Although numerous studies have been devoted to the monitoring activities of passive funds given the substantial capital flow from active funds to passive funds in the past few decades (see Brav et al. (2022b) for an overview), we demonstrate that actively managed funds are subject to a different set of incentives to engage and play an important role in supplying information independent of proxy advisory firms on the market. For regulators, the question becomes how to fulfill the mandate to foster good corporate governance under the rise of passive investing.

In this paper, we focus on the degree of activeness in fund voting, but we do not directly evaluate how informed these votes are. Recent research has attempted to address this issue by examining reactions to shareholder votes in terms of stock returns (Gao and Huang, 2021), but long-term value creation is much more difficult to capture. All things considered, assessing the quality of votes remains an important challenge for future research.

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2.A Illustrative example

The following example illustrates how the incentives for fund managers to vote actively vary depending on the stock's active weight. Table 2.A.1 demonstrates the composition of a portfolio and its benchmark as well as the stock returns.

Table 2.A.1. Illustrative example

Security	Portfolio weight	Benchmark weight	Active weight	Security return
Security A	40%	50%	−10%	5%
Security B	20%	30%	−10%	−5%
Security C	40%	20%	20%	10%
Sum	100%	100%	0%	-

In this example, the portfolio return is 5% and the benchmark return is 3%, resulting in a gross alpha of 2%. Note that although security A and security C have the same weight in the fund's portfolio, their active weights are very different because of how the benchmark portfolio is constructed. As a result, the incentives to monitor security C are larger than the incentives to monitor security A, in spite of the same portfolio weight. Let us assume that the fund manager votes proposals of security C in a value-enhancing manner, and that security C has generated higher returns than security A. Based on this portfolio allocation and active ownership strategy, the manager has outperformed the benchmark and thus is eligible for a bonus.

2.B Data details

2.B.1 Sample construction

The initial sample includes all U.S-based equity mutual funds that has been active since January 1, 2012. We include funds with either country of domicile equal to the United States or that the asset management company's management is located in the United States. For this restriction we use the fields *Domicile* and *Firm Country* from Morningstar Direct.

Our research question is how active weight affects voting behavior. Therefore, we make use of the field *Index Fund* and *Enhanced Index Fund* to exclude index and index-close funds from our main sample, as they do not have discretion in stock selection and may therefore have different incentives to vote actively. We also exclude funds classified as feeder funds and fund of funds by Morningstar, as these do not hold securities with voting rights.[17]

2.B.2 Details on merging the data

First, the portfolio holding data from Morningstar is linked to the voting data from Insightia at the fund level. Morningstar and Insightia use different fund identifiers and fund names are subject to different spelling practices. To establish an intermediate link, we utilize the fact that the fund names from the Insightia voting database are the same as those recorded in the SEC form N-PX filings. We manually match fund names from Morningstar to the fund names in the N-PX filings which are then linked to the voting database. While fund names change over time, SEC uses the same Central Index Key (CIK) identifier for each fund consistently. Thus, we are able to retrieve the complete voting history of all funds in our sample period.

Second, we link the voting data with the fund data at the stock level. Again, Insightia and Morningstar do not share any common identifiers on the security level that are well covered by both databases. As such, we have to match the securities from the two databases using security names. This is done in iterations, by first matching on the raw security names, before cleaning names to obtain a closer match. Lastly, we manually search through the remaining non-matching companies from the voting database and try to hand match them with the portfolio holdings. There is a tendency for Insightia to use a company's latest name and for Morningstar to keep using old company names. To the best of our ability we have searched the web for information on company name changes, mergers and acquisitions to try and match companies that are

[17] This exclusion is done based on the field *Fund of funds* from Morningstar.

present in both datasets but not matched due to different names. For the fund-security-meeting dates we have from Insightia, we ultimately have a complete match with Morningstar portfolio holdings.

Having linked both funds and securities across datasets, we also have to assign portfolio holdings to the relevant meeting dates. We thus match the data on voting to the most recent date where we have a portfolio holding. We allow for a maximum 60 days difference between meeting date and portfolio date, and give preference to the closest date *before* the meeting. However, if the meeting falls on the day before we observe the portfolio we use the most recent holdings.

2.B.3 Sample description

Summary statistics of our merged data set are presented in Table 2.B.1. Panel A shows that our sample contains 27,696,867 votes, of which 2,025,794 votes are contentious, cast by 3,745 individual mutual funds that voted in 794,379 proposals at the shareholder meetings of 14,709 firms from 2012 to 2021. In Panel B, the sample proposals are divided into a number of categories. We can see that the vast majority of proposals are sponsored by management and only a small fraction are sponsored by shareholders.

We take a closer look at the composition of portfolio holdings in Table 2.B.2. We notice that mutual funds on average hold 128 companies in their portfolios, significantly lower than the average number in benchmark portfolios which amounts to 1,322 companies. It means that the majority of companies in the benchmark portfolio are absent from mutual fund holdings (i.e., zero portfolio weight), and as a result, mutual funds do not have voting rights on these companies. Furthermore, the majority of companies included in the fund's portfolio are overweighted relative to the benchmark. It is rare that mutual funds hold a non-zero portfolio weight in a company while underweighting it relative to the benchmark. Consequently, in our merged data set, the number of votes cast on underweight companies is much smaller compared to that on overweight companies. This phenomenon reflects the so-called "Wall Street rule", according to which a fund manager either vote as management recommends or sell the stock.[18] It is also termed as the "Wall Street Walk" in the literature (Admati and Pfleiderer, 2009). It implies that, if dissatisfied with a company's performance, fund managers are likely to exclude the company's security from

[18]Disclosure of Proxy Voting Policies and Proxy Records by Registered Management Investment Companies, Securities Act Release No. 8131, Exchange Act Release No. 46,518, Investment Company Act Release No. 25,739, 67 Fed. Reg. 60,828 (proposed Sept. 20, 2002), available at `https://www.sec.gov/files/rules/proposed/33-8131.htm`, last accessed 2023-11-09.

their portfolios rather than holding an underweight and actively monitoring it. The action of exit is a form of governance in itself.

Table 2.B.1.
Summary statistics on merged sample

This table presents complementary summary statistics of our merged data set. Panel A: General characteristics of data structure based on mutual fund votes from the Insightia Voting database. Panel B: Number of proposals per category and by sponsor. Note: information on the sponsorship of some proposals is missing in the database.

Panel A: General Characteristics (no.)	
Observations (all votes cast by funds)	27,696,867
Observations (votes cast by funds on contentious items)	2,025,794
Years	10
Firms	14,709
Funds	3,745
Firms × Funds	1,022,978
Firms × Years	77,696
Funds × Years	26,836
Firms × Funds × Years	2,667,273
All proposals	794,379
Contentious proposals	77,193
Panel B: Proposal Categories (no.)	
Management proposals	785,925
Board of Directors	409,182
Remuneration	85,374
Committees & Reporting	151,622
Corporate Structure	99,410
General Governance	20,744
Environmental & Social	2,067
Shareholder proposals	8,440
Board of Directors	2,418
Remuneration	882
Committees & Reporting	335
Corporate Structure	709
General Governance	1,623
Environmental & Social	2,375

Table 2.B.2.
Summary statistics on portfolio holdings

This table presents summary statistics on the composition of fund holdings. Portfolio (N) refers to the total number of companies in the fund's portfolio. Benchmark (N) refers to the total number of companies in the benchmark portfolio. Overweight (N) refers to the number of companies in a fund that have a larger weight in the fund's portfolio than in the benchmark portfolio. Underweight (N) refers to the number of companies that are included in the benchmark, with a smaller weight in the fund's portfolio (including zero) than in the benchmark portfolio. Active underweight (N) refers to the number of companies in a fund that have a non-zero weight in the fund's portfolio, with a smaller weight in the fund's portfolio than in the benchmark portfolio.

Category	Mean	Median	SD	Min	Max
Portfolio (N)	128	64	275	1	7,609
Benchmark (N)	1,322	874	831	49	4,533
Overweight (N)	110	61	233	0	7,224
Underweight (N)	1,257	837	807	23	4,529
Active underweight (N)	16	0	82	0	2,367

2.B.4 Variables

Table 2.B.3.
Description of main variables

This table describes the main variables included in the regressions.

Variable	Description
Log fund TNA	Log of 1 + total net assets (in million USD).
Log family TNA	Log of 1+ the sum of the total net assets of all funds in the same management company as fund j in period t excluding fund j itself (in million USD).
Expense ratio	Annualized monthly expense ratio.
Net flow	Percentage growth in TNA, net of internal growth (assuming reinvestment of dividends and distributions).
Turnover	The lesser of purchases or sales (excluding all securities with maturities of less than one year) divided by average monthly net assets.
Gross alpha	Difference between the fund gross return and the average return of index funds in the fund's Morningstar category.
Active share	The percentage of a fund's portfolio holdings that differ from the benchmark index holdings, as defined in Cremers and Petajisto (2009).
Portfolio weight	Security i's weight in fund j's portfolio.
Active weight	Security i's weight in fund j's portfolio minus security i's weight in fund j's benchmark index.
Active vote	The percentage of votes against ISS recommendation cast by fund j on company i's agenda items.

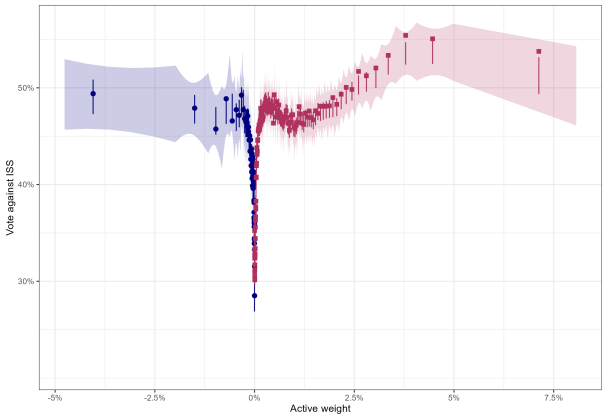
2.C Additional analysis: Binscatter plot

Given the large number of observations on the fund-company dimension, a classical scatter plot is too dense to parse. Instead, we employ a binscatter approach developed by Cattaneo et al. (2019) to visualize how active weight relates to the propensity to vote against ISS on contentious items while controlling for other covariates. We divide the data into bins according to the company's active weight in the fund's portfolio, and then compute the estimated average probability of voting against ISS for each bin, as represented by the dots in Figure 2.C.1. A binscatter is not only a visualization tool, but also an estimate of the conditional mean function. Therefore, we can quantify uncertainty and provide confidence bands that can be used to assess functional forms. Specifically, the vertical bar represents the 95% confidence interval of the estimator in each bin, and the shaded area covers the associated 95% confidence band showing the plausible functions compatible with the data. Panel A includes the entire sample of contentious votes, differentiating between underweight and overweight. In Panel B and Panel C, we exclude minimal active weights (-0.5% to 0.5%) because we are primarily interested in how incentives to monitor change when active weights have a significant influence over fund alphas. Also, measurement errors due to approximation of benchmark weights are likely to be more salient when active weights are small. To sum up, we clearly reject the null hypothesis of no relationship between active weight and active voting as the confidence band is outside the horizontal line at zero. Instead we find strong evidence of a roughly linear relation for large size of active weights (>0.5%) and little evidence of an effect for underweight cases.

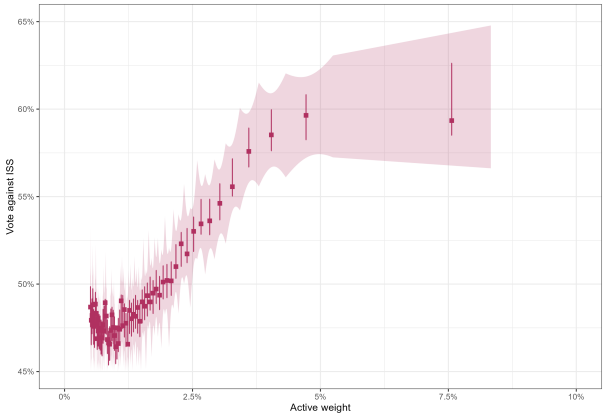
Figure 2.C.1.
Binscatter

This figure shows a binned scatter plot of active voting (voting against ISS) and active weight (difference between portfolio weight and benchmark weight) with covariates including portfolio weight (evaluated at the mean) and firm×year FE and fund×year FE for the sample of contentious votes. Following Cattaneo et al. (2019), we employ a covariate-adjusted least-squares extended binscatter estimator using piecewise polynomial. This method corrects for misrepresentation in the residualization approach. The number of bins is based on the IMSE criterion. The vertical bar represents the 95% confidence interval of the estimator in each bin. The shaded area covers the associated 95% confidence band showing the plausible functions compatible with the data. Panel A consists of the full sample of contentious votes. Panel B includes overweight above 0.5%. Panel C includes underweight under -0.5%.

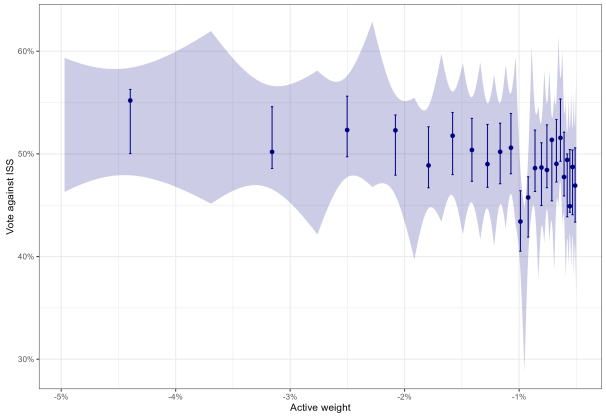
Panel A



Panel B



Panel C



Shareholder activism and the green transition

Xuan Li, Geir Drage Berentsen, Håkon Otneim, and Steffen Juranek

Abstract

This paper studies whether shareholder activism spurs environmental innovation and green technology development among firms. Focusing on environmental shareholder proposals as a commonly used climate engagement strategy, we do not find support for a positive effect of environmental shareholder activism on green innovation. We provide further evidence using an instrumental variable approach which indicates a decrease in corporate green innovation subsequent to shareholder activism. The results hold regardless of whether the proposals are environmentally material or whether the proposals are filed by institutional investors. Our findings suggest that shareholder proposals in their current form fail to drive long-term, substantive changes in how corporations adapt their business models in the transition to a low-carbon economy.

Keywords: Shareholder activism; ESG; Green innovation; Patents
JEL Classification G30; M14; O32; Q54

3.1 Introduction

Active ownership has gained significant popularity among institutional investors as a tool to address climate risks. According to a survey by Krueger et al. (2020) involving 439 institutional investors, engagement is preferred over divestment by the majority of respondents when it comes to climate risk. Additionally, about one-third of the surveyed investors have submitted shareholder proposals on climate risk issues, making it one of the top five engagement strategies related to climate risk. The desire to create a positive impact on the real world is cited as a strong motivation for this practice. However, the empirical evidence regarding the impact of active ownership is still limited, and the advocacy for engagement heavily relies on anecdotal stories.

A natural question to ask is: how effective are environmental and social (E&S) shareholder proposals in inducing desirable outcomes for shareholders and society at large? This question is particularly pertinent given the recent policy shift of the U.S. Securities and Exchange Commission (SEC). On November 3, 2021, the SEC issued a new staff legal bulletin, limiting the capabilities of companies to exclude E&S shareholder proposals from its proxy statement[1]. As a consequence, the year 2022 witnessed a surge in E&S shareholder proposals, with over 600 submissions as of July, representing an increase of nearly 20 percent from 2021 (Wall Street Journal, 2022a). Climate change is featured as the primary topic in these proposals (Welsh and Passoff, 2022). Moreover, only 15% of E&S shareholder proposals were excluded in the 2022 proxy season as of April 2022, a significant drop from 35% in 2021 and 43% in 2019 (Responsible Investor, 2022). Against this backdrop, the new SEC policy is hailed as a significant step in augmenting shareholder scrutiny and influence on companies in their portfolios (Wall Street Journal, 2022b).

In the meantime, a debate has emerged on whether filing E&S shareholder proposals constitutes micromanagement and potentially causes more harm than good. In the classic principal-agent relationship between shareholders and managers, shareholders inherently possess less information about the operations of the companies than managers. It is hardly surprising that managers often accuse shareholder proposals of being "distracting, time-consuming and costly"

[1]This new bulletin evaluates the subject of shareholder proposals in terms of their social policy significance. Issues such as human rights and climate change are deemed to bear broader societal implications and "transcend the ordinary business of the company." With regards to climate-related shareholder proposals that ask companies to set emission reduction targets and transition pathways, it further states that "proposals seeking detail or seeking to promote timeframes or methods do not per se constitute micromanagement." For details, see `https://www.sec.gov/corpfin/staff-legal-bulletin-14l-shareholder-proposals#_ftn1`.

(Wall Street Journal, 2021). Another divergence of interests between shareholders and managers stems from the discrepancy in preferences for environmental policies, particularly with the increasing adoption of ESG investments among institutional investors. This may lead to different dispositions towards the matters raised in environmental shareholder proposals.

To inform this debate, our study investigates the effect of environmental shareholder proposals on firms' green innovation measured by environment-related patents.[2] Environmental shareholder proposals address the environmental performance of company operations and their broader impacts, ranging from water pollution to climate change. The goals of these proposals are to encourage companies to enhance transparency regarding climate risks, adopt climate change strategies, and improve business resilience in the transition to a low-carbon economy. Given the popularity of environmental shareholder proposals, it is important to assess to what extent these goals are achieved. We measure the "real effects" of environmental shareholder activism from an innovation perspective because innovation is an indispensable element in the transition to a low-carbon economy (Aghion et al., 2014).[3] Existing studies have shown that government intervention is effective in directing corporate innovation from polluting technologies to cleaner alternatives (Aghion et al., 2013). In contrast, we explore whether shareholder intervention can have a similar effect.

We examine the quantity and quality of green patents developed by publicly listed firms in the U.S. This approach offers several advantages. Firstly, the use of green patents as a measure of a firm's efforts towards decarbonization and environmental protection reduces the susceptibility to greenwashing. Existing empirical studies on the environmental impact of shareholder engagement heavily rely on company disclosure (Flammer et al., 2021) and ESG rating (Dyck et al., 2019; Barko et al., 2021; Bauer et al., 2022b; Bonacchi et al., 2022) due to data availability issues. However, company disclosure without external auditing may not reveal the true extent of companies' environmental efforts (Marquis et al., 2016; Bingler et al., 2022), and ESG scores have faced criticism for their subjectivity and inconsistency (Berg et al., 2021, 2022). By focusing on green patents, which do not depend on self-reporting, we overcome these limitations. Secondly, green patents are well-suited for measuring the long-term impact of environmental shareholder activism, as green innovation is inherently risky and time-consuming, reflecting a company's long-term commitment to addressing climate change. For instance, Gao

[2]We use the phrases "green patent" and "environment-related patents" interchangeably in this paper.

[3]On a micro level, studies have found that firms developing more green technologies reduce more toxic chemical releases (Gao and Li, 2021), improve energy efficiency, launch more green products (Hege et al., 2022), and create real products that help abate carbon emissions (Cohen et al., 2021).

and Li (2021) documented a lasting reduction in pollution resulting from green innovation over a nine-year period following patent filing dates. Thirdly, by examining green patents, we are able to capture both the firms' climate change mitigation and adaptation efforts, aligning with the expectations of activist shareholders.[4] Our study advances previous studies by Akey and Appel (2020) and Naaraayanan et al. (2021) which focus solely on the effect of shareholder activism on emission reduction.

To conduct our empirical analysis, we aggregate patents on the firm level and merge them with other firm-level data sources using the firm identifier provided by Stoffman et al. (2022). We compile a comprehensive dataset on environmental shareholder proposals by combining shareholder resolution data from Insightia (formerly known as Proxy Insight) and the Ceres online engagement tracker.

To address endogeneity concerns arising from non-random assignment of environmental shareholder proposals, we employ a matching approach recently developed by Imai et al. (2021) to identify the causal effect of environmental shareholder activism on green innovation. We match each firm that received environmental shareholder proposals in a given year (referred to as the "treated" group) with other companies in the same industry that did not receive a proposal in the same year (referred to as the "control" group), while ensuring an identical treatment history for both groups over the three years preceding the treatment. Subsequently, we use propensity score matching to further refine the matched set, ensuring that the treated and matched control firms exhibit similar financial and sustainability characteristics. Finally, we estimate the treatment effect of environmental shareholder activism using a difference-in-differences estimator.

In addition to our matching approach, we complement our analysis with an instrumental variable approach proposed by Flammer et al. (2021). The instrument identifies whether a firm is targeted in an environment-themed campaign. The exogeneity of this instrument stems from the fact that in these campaigns, shareholders adopt an agenda and submit the same proposal to multiple firms, irrespective of firm-specific characteristics.

Our analysis does not support a positive effect resulting from the submission of environmental shareholder proposals on companies' green patenting activities. Instead, we observe a decrease in both the quantity and quality of green innovation output over the subsequent three years after being targeted by activist shareholders. These findings prompt us to investigate potential sources

[4]We adopt the OECD's definition of green patents (Haščič and Migotto, 2015) which has been widely used in other studies (Sautner et al., 2020; Cohen et al., 2021; Gao and Li, 2021; Andriosopoulos et al., 2022; Li et al., 2022), while broadening its scope to incorporate a new patent class for climate change adaptation technologies (Dechezleprêtre et al., 2020).

of heterogeneity within shareholder activism. Specifically, we examine the differential impact of proposals submitted by institutional investors compared to non-institutional investors, as well as the influence of the financial materiality of the proposals. Interestingly, we find an even stronger negative effect when environmental shareholder proposals originate from institutional investors or when the proposals are financially material. These results align with previous research by Andriosopoulos et al. (2022) and Cohen et al. (2021), demonstrating investors' lack of attention towards and insufficient reward for companies' green innovation efforts, both financially and non-financially. Our findings further contribute to the existing body of evidence highlighting the limited impact of external corporate governance on green innovation activities, as documented by Bolton and Kacperczyk (2021) and von Schickfus (2021). Consequently, our study raises doubts regarding the effectiveness of filing shareholder proposals as a means to drive transformative changes in companies' approaches to climate change mitigation and adaptation.

3.2 Related literature and hypothesis development

3.2.1 Corporate green innovation

To understand the impact of shareholder engagement on companies' green innovation, it is crucial to review the factors that determine a firm's ability to innovate. Previous studies have identified several drivers of a company's involvement in green innovation. CEO skills and personal characteristics have been linked to environmental innovation as well as overall corporate innovation (Arena et al., 2018; Custódio et al., 2019). Additionally, firms that create more green jobs tend to generate more green patents of higher quality (Darendeli et al., 2022). External factors, such as environmental regulations and policies, could also play an important role (Acemoglu et al., 2012). For example, research by Brunnermeier and Cohen (2003) indicates that increased pollution abatement expenditures are associated with higher levels of environmental innovation in U.S. manufacturing industries, while enhanced monitoring and enforcement efforts do not have a similar effect. Moreover, the European Union Emission Trading System has been found to stimulate low-carbon patenting without crowding out patents in other technology areas (Calel and Dechezleprêtre, 2016). Environmental shocks, such as nearby environmental spills, could also prompt firms to intensify their environmental innovation efforts in terms of both input and output (Chu et al., 2021).

Green innovation has been shown to benefit both firm performance and society. Firms gain

competitive advantages through green innovation, particularly in the face of stricter environmental regulations (Dai et al., 2020). These advantages often stem from the development of new green products based on environmental patents. Consistent with this notion, research by Hege et al. (2022) reveals that firms engaged in the development of climate-related technologies are more likely to announce new green products, which can contribute to carbon emissions reduction (Cohen et al., 2021). When green patents are put into application in firms' business operations, firms are able to reduce their environmental impact without compromising production levels. Therefore, green innovation is associated with reduced firm-level CO2 emissions and improved energy efficiency (Hege et al., 2022; Gao and Li, 2021).

The issue of induced green innovation is more complex for publicly traded companies due to the agency problem, wherein managers may not always act in the long-term best interest of shareholders. Managers exhibit a tendency to under-invest in innovation due to aversion to the risks associated with it (Holmström, 1999). For managers, a failed research and development (R&D) project can result in lower remuneration or even dismissal, while the benefits of a successful R&D project may take a considerable amount of time to materialize, potentially extending beyond their tenure. Myopic managers, who are primarily focused on meeting quarterly earnings targets, have limited incentive to invest in innovation (He and Tian, 2013). In the context of green innovation, the managerial agency problem is further exacerbated by the heightened risks associated with green patents in light of political and technological uncertainties (Dechezleprêtre et al., 2021). In line with the agency theory, Amore and Bennedsen (2016) find that worse governed firms produce fewer green patents relative to all their innovations.

We add to the literature on corporate green innovation by providing evidence on the role of investors in facilitating the redirection of corporate innovation efforts towards greener technologies.

3.2.2 Shareholder activism and innovation

Shareholder monitoring serves as a mechanism to mitigate the managerial agency problem. Aghion et al. (2013) find that institutional investors, who are more active monitors compared to retail investors, provide managers with a shield against career risks in case of failed innovation, leading to increased corporate innovation. Additionally, shareholders could impose long-term orientation on managers to mitigate the "time-based" agency conflict between shareholders and managers. Flammer and Bansal (2017) demonstrate that the adoption of shareholder proposals

on long-term executive compensation, as a proxy for long-term orientation, leads to higher investments in innovation.

Prior studies have provided evidence that investors can impose pro-social preferences on companies through engagement. Dyck et al. (2019) show that greater institutional ownership is associated with higher firm–level E&S scores. This effect is stronger for investors that are signatories to the United Nations Principles for Responsible Investment (UN PRI), who are more active shareholders. Azar et al. (2021) zoom in on the engagement pattern of the Big Three (i.e., BlackRock, Vanguard, and State Street Global Advisors) and find a negative relationship between their ownership and subsequent carbon emissions among MSCI index constituents. Furthermore, Naaraayanan et al. (2021) explicitly link firms' reduction in toxic releases, greenhouse gas emissions, and types of pollution to an environmental activist investing campaign initiated by the New York City Pension System, attributing this change to firms' increased capital expenditures on new abatement initiatives. Similar effects have also been identified for hedge fund activism (Akey and Appel, 2020; Chu and Zhao, 2019). To the best of our knowledge, no existing studies have examined the impact of environmental shareholder activism specifically on green innovation.

We complement the literature on shareholder activism, specifically the ability of activist shareholders to influence corporate environmental behavior. While existing studies primarily focus on private engagements by specific institutional investors (Dimson et al., 2015; Barko et al., 2021; Hoepner et al., 2021; Naaraayanan et al., 2021; Bauer et al., 2022a) or hedge fund activists (Chu and Zhao, 2019; Akey and Appel, 2020), we direct the attention towards environmental shareholder proposals as a form of public engagement. Through our findings, we contribute to the ongoing engagement versus divestment debate (Davies and Van Wesep, 2018; Becht et al., 2019; Broccardo et al., 2020; Berk and van Binsbergen, 2021).

3.2.3 Mechanisms of shareholder activism

One potential mechanism through which shareholder engagement influences corporate behavior is by reducing information asymmetry between shareholders and management. Corporations and investors have identified three value creation channels arising from shareholder engagement: communicative dynamics, learning dynamics and political dynamics (UN PRI, 2018). Investors can enable management to align business operations with their expectations on corporate actions regarding climate change by explicitly communicating these expectations through shareholder

proposals. Prior to the withdrawal or voting on the shareholder proposal, managers often engage in private negotiations with activist shareholders due to reputational concerns or the desire to avoid unfavorable voting outcomes (Bauer et al., 2015). These negotiations provide an opportunity for managers to disclose undisclosed information that allows investors to make more informed investment decisions. Moreover, the interaction between managers and shareholders during the engagement process facilitates knowledge exchange on complex ESG issues, such as climate change mitigation, helping corporations to better address these challenges.

Shareholder engagement could also exert pressure on companies to incorporate investors' non-pecuniary preference for positive environmental impact (Bénabou and Tirole, 2010). Filing shareholder proposals, often seen as a step beyond private engagement, is expected to carry more weight (UN PRI, 2021). By subjecting E&S issues to a democratic vote, shareholders can discipline managers in a public arena and encourage companies to internalize their environmental externalities. Such external pressure is found to be positively correlated with companies' propensity to engage in environmental innovation (Berrone et al., 2013). From the companies' perspective, if green innovation is valued by investors,[5] companies have the potential to lower their cost of capital by signaling progress in green innovation to shareholders (Li et al., 2022).

Despite the optimistic theories suggesting a positive impact of shareholder engagement, the effectiveness of filing environmental shareholder proposals alone in stimulating the necessary innovation to combat climate change remains uncertain. Anecdotal evidence and empirical studies yield conflicting results,[6] highlighting the need for further investigation. Several factors contribute to the potential ineffectiveness of shareholder proposals in achieving their intended outcomes. First and foremost, shareholder proposals generally receive very low support from shareholders at annual meetings, while management consistently advises against voting in favor of these proposals. This widespread resistance among investors and managers creates significant hurdles for the success of such proposals. Additionally, shareholder proposals in the United States are non-binding, which means that even if they receive majority votes, there is no legal

[5]Empirical evidence on this issue is inconclusive. For example, Andriosopoulos et al. (2022) and Hege et al. (2022) found opposite results concerning the market reaction to green patent development

[6]For example, Rindfleisch (2008) concluded after reviewing several case studies on climate-related shareholder proposals that "shareholder proposals are an effective means of furthering climate change-related progress in American oil and gas corporations... by and large these proposals are a catalyst for climate change-related disclosure, analysis, and action." More recently in April 2022, New York State Comptroller claimed that their shareholder proposals prompted companies to take actions to address investment risks posed by climate change and impacts of environmental justice. Flammer et al. (2021) show that firms voluntarily disclose more information on climate change risks in response to receiving environmental shareholder proposals. Similarly, Bauer et al. (2022a) document improvement in firms' ESG scores after receiving E&S shareholder proposals, although they didn't find any significant change in emission reduction.

obligation for managers to implement the proposed actions. Consequently, managers may choose to deprioritize or ignore these proposals altogether (Ertimur et al., 2010). Importantly, Levit and Malenko (2011) show that managers generally disregard nonbinding voting outcomes for shareholder proposals unless they face the possibility of a proxy fight from activist investors. This suggests that nonbinding votes may have limited influence on managerial decision-making.

Moreover, it is essential to consider the quality and impact of shareholder proposals. Contrary to the conventional belief that an increased number of shareholder proposals would lead to greater effects, Gantchev and Giannetti (2020) find that lowering the threshold for filing such proposals could potentially attract low-quality resolutions from ill-informed shareholders. The implementation of these proposals may inadvertently harm shareholder value. In a similar spirit, Matsusaka et al. (2021) document a positive market reaction in response to the issuance of no-action letters.[7] This suggests that investors anticipated a negative impact on firm value had these proposals been passed.

Last but not least, E&S proposals may be overly prescriptive (Norges Bank Investment Management, 2020) and the level of prescriptiveness has witnessed an increase, particularly following the SEC policy shift concerning the scope of micromanagement (Wall Street Journal, 2022a). Notably, big institutional investors exhibit an unfavorable stance towards overly prescriptive shareholder proposals and prefer to express their dissatisfaction by voting against directors, rather than supporting a shareholder proposal, based on companies' existing ESG performance (BlackRock, 2021; Vanguard, 2021).

Weighed against the cited work, these arguments highlight the importance of empirically testing the relation between shareholder activism and green innovation.

3.3 Data

3.3.1 Environmental shareholder proposals

We collect data on environmental shareholder proposals from Insightia (formerly known as Proxy Insight). The Insightia Voting database provides comprehensive coverage of shareholder proposals globally, including information on the proposal's proponents, type, date, status, and voting results. We complement it with the Ceres Engagement Tracker, which systematically tracks

[7] Under Rule 14a-8, when a company wants to exclude a shareholder proposal from its proxy statement, it must submit a so-called "no-action letter" seeking insurance from the SEC staff that no enforcement action will be carried out if it omits the proposal.

all climate-related shareholder proposals filed in the U.S.[8] Where there is missing information, we manually review publicly disclosed documents from the proponents' websites.[9] To avoid misclassification, we read the actual text of shareholder proposals to verify if they are truly environment-related.

Our sample consists of 1,473 environmental shareholder proposals filed at 458 publicly listed U.S. firms from 2009 to 2020. While many consider the withdrawal of proposals a sign of success because management has indicated willingness to change (e.g., Bauer et al., 2022a), Ertimur et al. (2010) find that management is highly unlikely to implement non-majority vote shareholder proposals. To avoid sample selection bias, we include all environmental shareholder proposals regardless of whether they are withdrawn, omitted or voted on. Figure 3.3.1 shows the number of environmental shareholder proposals by status across years in our sample. Nearly half of these environmental shareholder proposals are withdrawn prior to the annual meeting.[10] This aligns with previous findings that environmental and social shareholder proposals are characterized by a high withdrawal rate (Bauer et al., 2022a) and low voting support (He et al., 2023).

Figure 3.3.2 depicts the distribution of environmental shareholder proposals by Fama-French 12 industry classification. There is noticeable industry heterogeneity, suggesting that some industries are more likely to be targeted by shareholders than others. Two carbon-intensive industries, Energy and Utilities, rank top two in terms of the number of environmental shareholder proposals filed. This corroborates the survey evidence, which shows that investors extensively use shareholder proposals as an engagement tool to address climate risks (Krueger et al., 2020).

3.3.2 Patent data

We obtain patent data from the United States Patent and Trademark Office (USPTO) and Stoffman et al. (2022) who match the patent assignees to firms in the CRSP database with permco identifier[11]. The PatentsView database from USPTO provides information on the patent assignee, the backward and forward citations of the patent, the technology class of the patent (CPC classification), and the patent's application and grant year, among others. To categorize

[8]The data is available at `https://engagements.ceres.org/`.

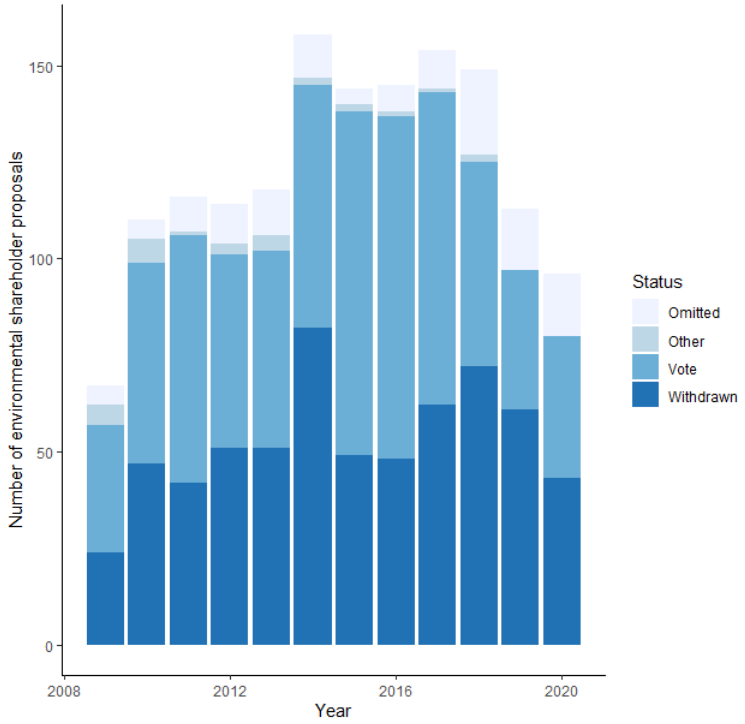
[9]If a proposal is informally withdrawn in the event that a "no-action" letter was not submitted, it would not be captured in the SEC data repository. We overcome this limitation by hand collecting information from the proponents' websites. For example, New York State Comptroller discloses all the shareholder proposals it has submitted annually in the Shareowner Initiatives Postseason Report on its website: `https://comptroller.nyc.gov/reports/shareowner-initiatives-postseason-report/`.

[10]Refer to Bauer et al. (2015) for a detailed review of the withdrawal process.

[11]The Patent-CRSP permco match data is available for download on Michael Woeppel's website: `https://www.mikewoeppel.com/data`. This database includes 8,576 unique permcos matched to utility patents in 1976 to 2021.

Figure 3.3.1. Environmental shareholder proposals by status

This figure displays the distribution of environmental shareholder proposals by status across time. The number of proposals shows some variation but no clear time trend. The majority of proposals are either voted on at annual general meetings (AGMs) or withdrawn by shareholders prior to AGMs.

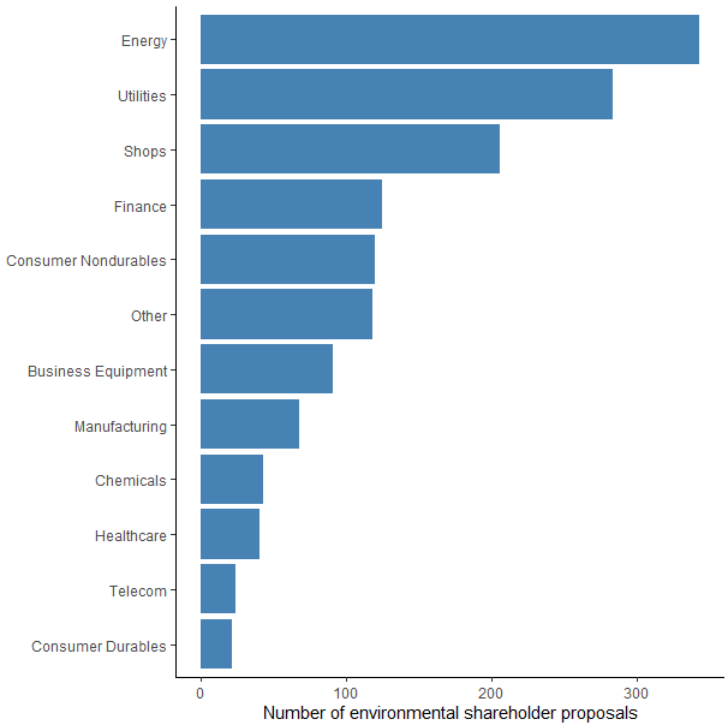


green patents, we follow the classification developed by the OECD (Haščič and Migotto, 2015; Dechezleprêtre et al., 2020), reflecting standard practice in the literature (see, e.g., Cohen et al., 2021; Andriosopoulos et al., 2022; Sautner et al., 2020; Gao and Li, 2021; Li et al., 2022). Additionally, we incorporate a new category introduced by the European Patent Office for patents related to "technologies for adaptation to climate change" (Y02A), updating the identification scheme from Haščič and Migotto (2015). The content of green patents spans a wide range of technologies, including pollution abatement, waste management, water conservation, climate change mitigation and adaptation.

Using the aforementioned data, we construct firm-level metrics for the quantity and quality of green patents, respectively. Firstly, we count the number of green patents applied by each firm in a given year. The number is assumed to be zero if a firm does not appear in the patent database in a given year. Since patents appear in the database only after they are granted, there is a lag (typically 18 months according to Haščič and Migotto (2015)) between the application date and the grant date. As a result, patent applied near the end of our sample period may still

Figure 3.3.2. Environmental shareholder proposals by industry

This figure plots the total number of environmental shareholder proposals in 2009-2020 across Fama-Frency 12 industries. Two carbon-intensive industries, Energy and Utilities, are most targeted by shareholders.



be pending, causing a downward bias in the number of green patents. We follow the procedure in Hall et al. (2001, 2005) to correct for this bias. This procedure involves estimating truncation correction weights based on the empirical distribution of the application-grant lag[12]. Secondly, we estimate the number of citations received by each green patent throughout its lifetime. The truncation bias is more pronounced for citations, as a patent can be cited even decades after its grant. We mitigate this problem by dividing the observed citation counts by the fraction of predicted lifetime citations based on a citation-lag distribution (Hall et al., 2001, 2005).

Finally, we cross-check the validity of the patent-CRSP permco match and the bias correction procedure by comparing the top green innovators we identified with those listed in Cohen et al. (2021). We find a substantial overlap, with any remaining discrepancies likely attributable to differences in the time periods considered.

[12]This procedure is widely accepted in the literature. See for example Amore and Bennedsen (2016) and Brav et al. (2018).

3.3.3 Other data

We obtain institutional ownership and total carbon emissions data from Refinitiv. The original source of the institutional ownership data from Refinitiv is SEC's Form 13F filings. Refinitiv's estimated total CO2 and CO2 equivalents emission measure includes scope 1 emissions (i.e., direct emissions from owned or controlled sources caused by fossil fuel combustion at company facilities and vehicles) and scope 2 emissions (i.e., indirect emissions from the generation of purchased energy consumed by the company).

Lastly, we collect financial and accounting data from CRSP and Compustat. We extract a number of annual metrics, including total assets, book-to-market ratio, return on assets, and R&D expenditure. We also obtain the four-digit Standard Industrial Classification (SIC) code for each company, based on which we derive the Fama-French 12 industry classification.

We merge all the datasets mentioned above to form the master dataset. The summary statistics are presented in Table 3.3.1. The definitions of all variables are presented in the Appendix.

Table 3.3.1. Summary statistics

Variables	N	Mean	Std.Dev.	p25	p50	p75
# Env. shareholder proposal	64,843	0.02	0.20	0.00	0.00	0.00
# Env. shareholder proposal - institutional investors	64,843	0.02	0.14	0.00	0.00	0.00
# Env. shareholder proposal - financially material	64,843	0.01	0.15	0.00	0.00	0.00
# Green patents	64,843	1.42	18.71	0.00	0.00	0.00
# Green citations	64,843	34.78	563.91	0.00	0.00	0.00
Green patent ratio	15,286	0.08	0.20	0.00	0.00	0.05
# Avg. citation of green patents	15,286	9.91	46.26	0.00	0.00	14.43
Log(1+assets)	58,526	6.85	2.29	5.27	6.86	8.34
Book-to-market	41,591	0.97	30.48	0.29	0.56	0.93
Return-on-asset	42,870	0.003	0.66	0.01	0.07	0.14
Institutional ownership	31,249	0.69	0.31	0.48	0.77	0.93
Log(1+emissions)	17,903	10.56	2.93	8.55	10.56	12.45
R&D expenses	33,124	171.80	933.39	0.00	9.65	51.26

3.4 Empirical strategy and main results

Our analysis involves comparing firms that have received environmental shareholder proposals with firms that have not. However, the intervention of investors is not random, which introduces concerns about potential selection bias. To address endogeneity concerns about unobservable time-varying firm characteristics, we use a matching approach designed specifically for time-series cross-sectional data (Imai et al., 2021). They show that their matching estimator is more robust to model misspecification than the standard two-way fixed effects regression estimator.

3.4.1 Panel matching

Following Imai et al. (2021), we define treatment as receiving environmental shareholder proposal(s) in a given year and no shareholder proposals in the preceding year. Figure 3.4.1 shows the treatment status of all target firms in our sample. During our sample period, many firms receive a number of environmental shareholder proposals in several non-consecutive years, resulting in a discontinuous treatment pattern. This differs from the conventional setting in the shareholder activism literature where the activist campaign is a one-time event and there is a clear-cut pre-treatment vs. post-treatment distinction (Brav et al., 2018; Akey and Appel, 2020; Naaraayanan et al., 2021).

This poses a challenge for causal inference with traditional matching methods designed for cross-sectional data. One possible solution is to divide all firms into two groups: a treatment group consisting of firms that received at least one proposal during the sample period, and a control group comprising firms that never received a proposal, and then match each firm in the treatment group to firms in the control group. This approach, however, disregards valuable information contained in the non-targeted firm-year observations within the treatment group and fails to address potential carryover effects from previous treatments.

In contrast, the method developed by Imai et al. (2021) is well-suited for our setting. This method accommodates units that switch their treatment status multiple times over time. To account for confounding effects from previous treatments, we match each treated firm-year observation with untreated observations in the same year, with an identical treatment history for the previous three years. We also conduct a within-industry matching to alleviate concerns related to aggregate industry-level trends that could influence green patenting activities and the level of shareholder activism targeting a specific industry.

Let X_{it}, denote a binary treatment indicator taking the value one if firm $i = 1, \ldots, N$ receives an environmental shareholder proposal in year $t = 1, \ldots T$, and zero otherwise. For each treated firm-year ($X_{it} = 1$ and $X_{i,t-1} = 0$), define the corresponding set of matched firm-years having the same treatment history in the three preceding years as

$$\mathcal{M}_{it} = \{i' : i' \neq i, X_{i',t} = 0, X_{i',t'} = X_{it'} \text{ for all } t' = 1, 2, 3, \text{FF}_{i'} = \text{FF}_i\},$$

where FF_i is the Fama French 12 industry classification of firm i. See Figure 3.4.2 for a visual representation of the matching technique. Note that we also match on the time index t to address any time-specific confounding factors.

Figure 3.4.1. Treatment status of all target firms

This figure displays the distribution of treatment (receiving environmental shareholder proposals) for each firm across years, in which an orange (blue) line represents a treatment (control) firm-year observation. White line represents the years when a firm did not exist. The horizontal axis represents the years of 2009 to 2020. The vertical axis represents company identifier (permco).

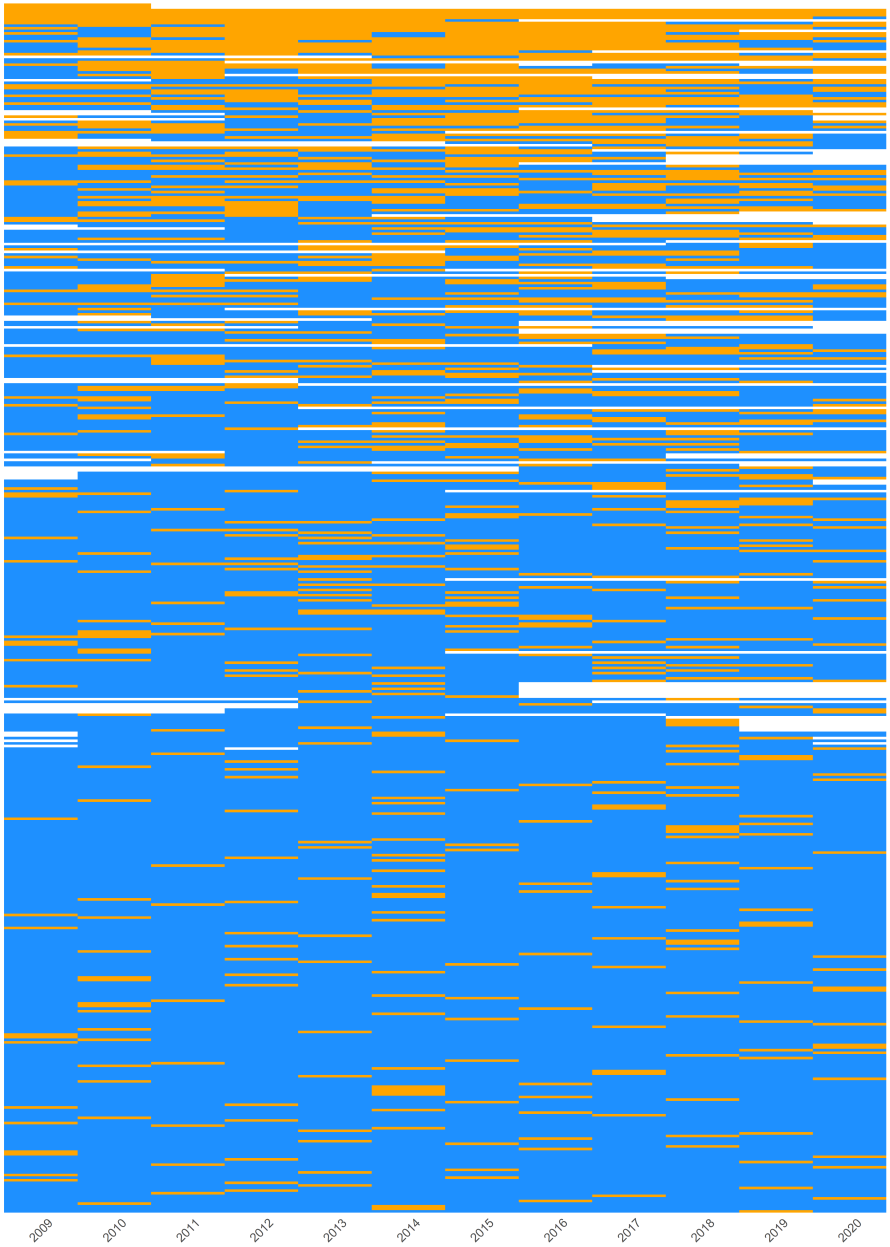
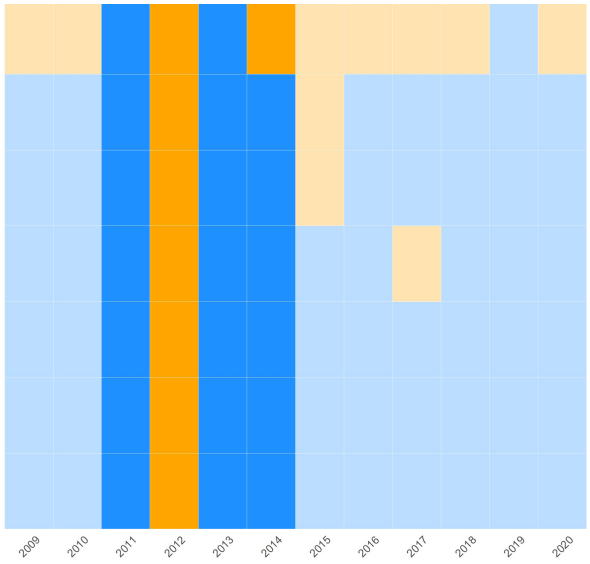


Figure 3.4.2. Panel matching - an example

This figure displays the matching procedure as described in Section 3.4.1. In this example, the observation on the first row in 2014 (orange) refers to a treated firm-year, and the observations below the first row in 2014 (blue) are the matched untreated firm-years. Note that the treated observation and the matched control observations have an identical treatment history for the previous three years (2011-2013). On top of this, we also impose an additional constraint of treated and control firms being in the same Fama-French industry.



Selecting the duration of the matching period involves a trade-off between bias and variance. On the one hand, a longer matching period is desirable as past treatments play a crucial role as confounders, potentially influencing both the current treatment and outcome. Conversely, an extended matching period limits the number of eligible treated units and the availability of comparable non-treated units with an identical treatment history. Considering our dataset spanning from 2009 to 2020, a matching period of three years strikes a balanced compromise between these two considerations.

Conditional on having the same three-year treatment history and belonging to the same industry, the target and control observations in the matched set may still exhibit differences in firm characteristics. To address this concern, we use a matching refinement technique, which is one of the methods that Imai et al. (2021) propose to further refine the matched set $\mathcal{M}_{it}$. This entails that we use a distance metric that compares the propensity score of unit i at time t with each member i' of $\mathcal{M}_{it}$. This process results in a new matched set, denoted as $\mathcal{M}_{it}^{*}$, which comprises the R members i' that exhibit the highest similarity to i based on this measure. In our analysis, we set $R = 5$. The conclusions of this paper remain unchanged for any choice of R, but as we show in Section 3.4.3, setting $R = 5$ results in excellent covariate balance

between the treated units and the control units. The covariates employed in the propensity score matching include the following firm characteristics; size, book-to-market ratio, return on assets (ROA), institutional ownership, and carbon emissions. Observations with missing values on some characteristics are excluded from the matched set. This procedure results in a total of 187 treated firm-year observations with successful matches, i.e., the matched set $\mathcal{M}_{it}^*$ contains at least one unit.

3.4.2 Difference-in-Differences estimator

We are interested in examining whether environmental shareholder activism has an impact on the green innovation strategies of target firms, beyond what would have occurred if the company had not received any proposals and the shareholding structure remained unchanged. To estimate the average treatment effect on the treated (ATT) F years after the treatment, we compare the actual outcomes of the treated units, denoted by $Y_{i,t+F}$, with the counterfactual outcome approximated by the weighted average of the control units in the refined matched set $\mathcal{M}_{it}^*$. More specifically, Imai et al. (2021) propose the following difference-in-differences estimator of the ATT:

$$\hat{\delta}(F) = \frac{1}{\sum_{i=1}^{N}\sum_{t=4}^{T-F} D_{it}} \sum_{i=1}^{N}\sum_{t=4}^{T-F} D_{it} \left\{ (Y_{i,t+F} - Y_{i,t-1}) - \frac{1}{|\mathcal{M}_{it}^*|} \sum_{i' \in \mathcal{M}_{it}^*} \left(Y_{i',t+F} - Y_{i',t-1}\right) \right\},$$

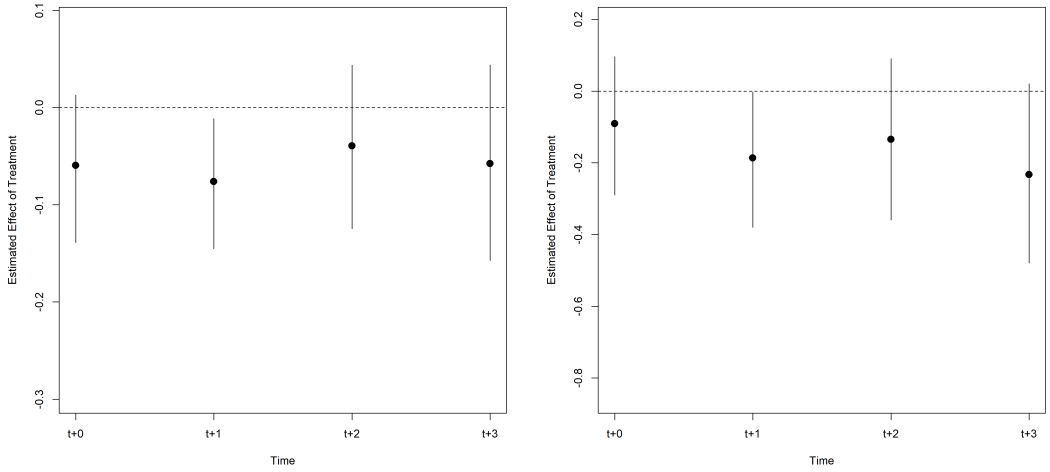
where $|\mathcal{M}_{it}^*|$ denotes the number of control units in $\mathcal{M}_{it}^*$. Moreover, D_{it} is a dummy variable that identifies the 187 firm-years that have received treatment and have non-empty set of control units ($|\mathcal{M}_{it}^*| > 0$).

We estimate both the contemporaneous effect ($F = 0$) and the forward effects over a three-year period ($F = 1, 2, 3$) following the treatment. It is reasonable to assume that three years is an appropriate timeframe for potential effects of shareholder activism on green innovation to become evident, as observed in previous studies using difference-in-difference designs. For example, Brav et al. (2018) demonstrate a significant increase in corporate innovation efficiency during the three-year window subsequent to hedge fund activism. Amore and Bennedsen (2016) reveal a decrease in firms' green patenting activities within three years following the passage of anti-takeover legislation in the US.

Figure 3.4.3 plots the estimated effect of environmental shareholder activism on green innova-

Figure 3.4.3. Difference-in-differences estimation

This figure plots coefficients from a panel matched difference-in-differences specification, where the horizontal axis is in event time relative to the year of receiving environmental shareholder proposals. The dependent variable is the natural logarithm of one plus the number of green patents at firm-year level (left panel), and the natural logarithm of one plus the number of citations for green patents applied for by each firm in a given year (right panel), respectively. The estimated coefficients and their corresponding 95% confidence intervals correspond to the difference in the number of green patents of targeted firm-years to the number of green patents belonging to panel matched control firm-years.



tion. The outcome variable ($Y_{i,t}$) is the natural logarithm of one plus the number of new green patents (left panel) and the natural logarithm of one plus the number of citations for green patents applied for by each firm in a given year (right panel), respectively. Hence, the estimated coefficients should be interpreted in semi-elasticity terms. In terms of the quantity of green patents, the coefficients for the event year and the three subsequent years are -0.06 (SE $= 0.04$), -0.08 (SE$= 0.03$), -0.04 (SE $= 0.04$), and -0.06 (SE $= 0.05$), respectively. These estimates consistently indicate that target firms file fewer green patents after receiving environmental shareholder proposals. However, it is important to interpret these results with caution, as most of the estimated coefficients are not statistically different from zero at the 5% significance level. This suggests that the presence of environmental shareholder proposals alone is insufficient to drive changes in corporate green innovation and, in the worst-case scenario, may have a negative effect.

Apart from the number of green patents, we also examine the quality of green patents. Similar to the left panel in Figure 3.4.3, all the estimated coefficients are consistently negative and borderline significant. These results do not appear to support the notion that companies respond to environmental shareholder activism by allocating resources to enhance the quality

of their green innovations rather than merely pursuing a greater quantity of patents.

3.4.3 Covariate balance and the parallel trend assumption

We investigate two fundamental identification assumptions of this approach. Firstly, the observed firm characteristics should be comparable between the treated and matched control units. Secondly, after conditioning on the treatment history and the covariate history, the trends in outcome variables should be parallel on average between the treated observations and their matched control units.

Let V_{itj} denote the jth firm characteristic (including outcome variables) for unit i at time t. Following Imai et al. (2021), we examine the standardized mean difference between V_{itj} for the treated firm and its values for the matched control units for ℓ pre-treatment years ($\ell = 1, 2, 3$):

$$\overline{B}(j,\ell) = \frac{1}{N_1}\sum_{i=1}^{N}\sum_{t=4}^{T-F} D_{it}B_{it}(j,\ell),$$

where $N_1 = 187$, and

$$B_{it}(j,\ell) = \frac{V_{i,t-\ell,j} - |\mathcal{M}^*_{it}|^{-1}\sum_{i'\in\mathcal{M}^*_{it}} V_{i',t-\ell,j}}{\sqrt{\frac{1}{N_1-1}\sum_{i'=1}^{N}\sum_{t'=4}^{T-F} D_{i't'}(V_{i',t'-\ell,j} - \overline{V}_{t'-\ell,j})^2}}.$$

As shown in Figure 3.4.4, the target and matched firms are very similar along the observed characteristics after matching refinement. Importantly, our matched sets are also balanced in green innovation inputs and outputs during the pre-treatment periods, despite the fact that these characteristics are not part of the matching criteria, lending support to the assumption of a parallel trend.

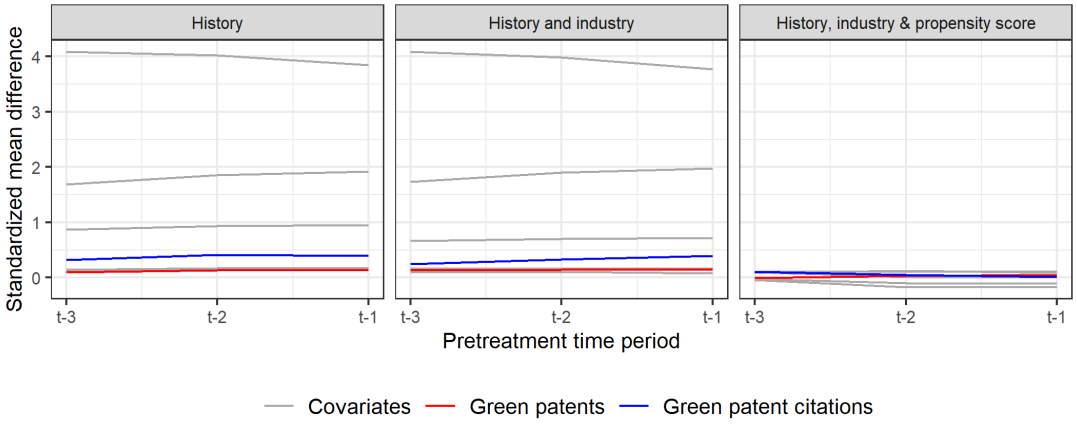
3.5 Additional analysis

3.5.1 Instrumental variable approach

Our main empirical strategy relies on a non-parametric approach. While it is less sensitive to model specification compared with linear regression models with fixed effects, it suffers from two important limitations. The first one is that not all treated observations can be matched and those unmatched ones are discarded from the subsequent difference-in-differences estimation, affecting the composition of the treated group. Another limitation relates to firms' treatment status changes during the F lead time periods, affecting the causal interpretation of our results.

Figure 3.4.4. Covariate balance

This figure displays the mean difference of each covariate (and outcome variables) between a treated observation and its matched control observations over three pretreatment years for increasing levels of matching refinement: History matching (left panel), History and industry matching (center panel), and history, industry and propensity score matching (right panel). The difference is standardized at each pretreatment time period by the standard deviation of each covariate across all treated observations in the data.



Given these limitations, we also employ a two-stage least squares regression analysis using the instrumental variable approach proposed by Flammer et al. (2021) as an alternative check. The instrument we utilize exploits the fact that when an investor submits the same shareholder proposal to multiple companies simultaneously as part of a themed campaign, the environmental proposals are more likely to be exogenous with respect to any specific firm characteristics. Specifically, our instrument is a dummy variable that equals one if the company is targeted by a shareholder who submits the same environment-related proposal to at least five companies in the same year (referred to as an environmental activism wave).

In the first stage, we estimate the following regression model:

$$X_{i,t} = \alpha_i + \alpha_t + \beta \cdot \text{Environmental Activism Wave}_{i,t} + \gamma' \cdot \text{Controls}_{i,t-1} + \epsilon_{i,t} \qquad (3.1)$$

where $X_{i,t}$ is the number of environmental shareholder proposals filed at firm i in year t. $\text{Controls}_{i,t-1}$ is a vector of time-varying firm characteristics, including size, return on assets, book-to-market ratio, carbon emissions, institutional ownership, and research and development (R&D) expenses. Finally, α_i and α_t are firm fixed effects and year fixed effects, respectively. The error term is denoted by ϵ.

The predicted values from Equation (3.1) provide the number of environmental shareholder proposals (instrumented). In the second stage, we estimate the following model using the

instrumented environmental shareholder proposals:

$$\sum_{k=1}^{K} Y_{i,t+k} = \alpha_i + \alpha_t + \beta^{2SLS} \cdot \hat{X}_{i,t} + \gamma' \cdot \text{Controls}_{i,t-1} + \epsilon_{i,t} \tag{3.2}$$

where the dependent variable $\sum_{k=1}^{K} Y_{i,t+k}$ measures the cumulative number of new green patents of firm i from year $t+1$ to year $t+k$. We estimate the model for $K = 1, 2, 3$.

Our selection of control variables is motivated by previous findings in the literature (Amore and Bennedsen, 2016; Brav et al., 2018; Azar et al., 2021; Naaraayanan et al., 2021). The inclusion of control variables mitigates concerns about omitted variable bias. Firm size (measured by total assets) may be correlated with both the likelihood of being targeted by environmental shareholder proposals and the volume of the firm's innovation. Similarly, book-to-market and return-on-asset ratios control for the firm's growth opportunities and past profitability, respectively. Additionally, higher carbon footprints and institutional ownership could both draw greater investor attention and indicate a stronger inherent propensity for green patenting activities. R&D spending, as a measure of innovation input, is likely to predict innovation outputs. Firm fixed effects account for time-invariant unobserved heterogeneity at the firm level. The inclusion of year fixed effects accounts for a general time trend that is not firm-specific.

In Table 3.5.1, we estimate the specifications (3.1) and (3.2) where the number of environmental shareholder proposals is instrumented by the indicator variable of environmental activism wave. The baseline results for the first stage estimation are reported in Column (1) of Panel A. The coefficient on the instrument is 1.00 (SE=0.06), which aligns with the findings of Flammer et al. (2021). The F-statistics indicate strong instruments, exceeding the conventional threshold of F=10.

The second stage regressions, reported in Column (2) to (7) of Panel A, focus on two main dependent variables. In terms of the quantity of green innovation, the coefficients on environmental shareholder proposals (instrumented) are largely in line with the post matching difference-in-differences estimation, ranging from -0.10 (SE=0.04) to -0.07 (SE=0.04). Contrary to investors' expectations, firms produce fewer green patents in the three years following environmental shareholder activism. The results for the quality of green innovation, measured by citations, also indicate a negative impact of environmental shareholder activism. Overall, the two-stage least squares analysis supports the findings of the post-matching difference-in-differences approach and helps address concerns regarding endogeneity bias.

While the aforementioned results demonstrate either no change or a decline in firms' overall output of green innovation after shareholder activism, they do not shed light on the firms' adoption of brown (or polluting) technologies. It is important to note that corporate innovation is highly path dependent (Aghion et al., 2016). Brown (polluting) companies tend to engage more in innovation activities primarily aimed at improving the efficiency of their existing brown operations (Bolton et al., 2022). Phasing out brown technologies could also signify decarbonization efforts, which is not captured in the absolute number of green patents. To explore this possibility, we examine the proportion of green patents to total patents, referred to as the green ratio. A higher green ratio indicates that firms allocate a larger share of their R&D resources to the development of green technologies rather than brown ones. The results are presented in Column (2) to (4) of Panel B. However, the coefficients on environmental shareholder proposals remain negative, contradicting the resource-reallocation argument. Additionally, Column (5) to (7) in Panel B investigate an alternative measure of green patent quality — the average number of citations for new green patents.

Table 3.5.1. Environmental shareholder proposals and green innovation(2SLS)

The dependent variables on green patents are adjusted for truncation bias. Standard errors clustered at the firm level are in parentheses. *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively. Intercepts are omitted.

Panel A: Changes in cumulative number of green patents and citations

	First Stage	Second Stage					
Dependent Variables:	Env.Proposal$_t$	Green Pat$_{t+1}$	Green Pat$_{t+1,2}$	Green Pat$_{t+1,2,3}$	Green Pat Cite$_{t+1}$	Green Pat Cite$_{t+1,2}$	Green Pat Cite$_{t+1,2,3}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Env.Proposal(instr.)$_t$		-0.07*	-0.10**	-0.07*	-0.17*	-0.24**	-0.18*
		(0.04)	(0.04)	(0.04)	(0.10)	(0.09)	(0.10)
Env.Activism wave$_t$	1.0***						
	(0.06)						
Log(1+assets$_t$)	0.03**	0.09***	0.11***	0.12**	0.18***	0.17**	0.19*
	(0.01)	(0.03)	(0.04)	(0.05)	(0.06)	(0.08)	(0.11)
Book-to-market$_t$	0.02	0.02	-0.02	-0.04	0.04	-0.04	-0.07
	(0.01)	(0.02)	(0.04)	(0.05)	(0.06)	(0.09)	(0.10)
ROA$_t$	-0.03*	0.01	0.04	0.11	0.05	0.11	0.30
	(0.02)	(0.04)	(0.09)	(0.14)	(0.11)	(0.24)	(0.36)
Log(1+emissions$_t$)	0.006	0.01	0.03**	0.03	0.01	0.07**	0.06*
	(0.005)	(0.01)	(0.01)	(0.02)	(0.03)	(0.03)	(0.04)
Institutional ownership$_t$	-0.08**	-0.04	0.07	0.27**	0.15	0.39*	0.76**
	(0.03)	(0.07)	(0.10)	(0.13)	(0.18)	(0.24)	(0.30)
Log(1+R&D expenses$_t$)	0.001	0.03	0.02	0.02	-0.005	-0.05	-0.08
	(0.009)	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)	(0.06)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,221	7,221	5,884	4,658	7,221	5,884	4,658
F-statistic (instrument)	2,438.8	-	-	-	-	-	-
R^2	0.72	0.91	0.94	0.96	0.84	0.90	0.93
Within R^2	0.26	0.007	0.009	0.01	0.002	0.004	0.008

Panel B: Changes in green patent ratio and average citations

	First Stage	Second Stage					
Dependent Variables:	Env.Proposal$_t$	Green Ratio$_{t+1}$	Green Ratio$_{t+2}$	Green Ratio$_{t+3}$	Green Pat Avg Cite$_{t+1}$	Green Pat Avg Cite$_{t+2}$	Green Pat Avg Cite$_{t+3}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Env.Proposal(instr.)$_t$		-0.02**	-0.005	0.006	-0.16	-0.31***	-0.14
		(0.01)	(0.007)	(0.01)	(0.12)	(0.12)	(0.11)
Env.Activism wave$_t$	1.1***						
	(0.09)						
Log(1+assets$_t$)	0.04*	0.008	-0.007	-0.01	0.15*	0.09	0.12
	(0.02)	(0.008)	(0.009)	(0.02)	(0.08)	(0.09)	(0.12)
Book-to-market$_t$	0.06**	-0.004	0.003	0.02	-0.09	-0.19	-0.28
	(0.03)	(0.01)	(0.01)	(0.02)	(0.11)	(0.15)	(0.17)
ROA$_t$	-0.03	-0.006	-0.03	0.04	0.02	-0.05	0.10
	(0.02)	(0.01)	(0.04)	(0.06)	(0.14)	(0.34)	(0.46)
Log(1+emissions$_t$)	0.007	0.008**	0.006	0.005	0.008	0.03	0.01
	(0.007)	(0.004)	(0.006)	(0.008)	(0.04)	(0.05)	(0.05)
Institutional ownership$_t$	-0.10*	0.002	0.01	0.04	0.53*	0.77**	0.87**
	(0.05)	(0.03)	(0.03)	(0.04)	(0.28)	(0.32)	(0.40)
Log(1+R&D expenses$_t$)	0.002	-0.01	-0.007	-0.003	-0.07	-0.04	-0.07
	(0.01)	(0.007)	(0.005)	(0.005)	(0.06)	(0.06)	(0.05)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,185	4,185	3,449	2,785	4,185	3,449	2,785
F-statistic (instrument)	1,316.1	-	-	-	-	-	-
R^2	0.76	0.74	0.77	0.77	0.66	0.67	0.68
Within R^2	0.24	-0.002	0.004	0.003	0.002	0.002	0.004

3.5.2 Possible heterogeneity

In this section, we aim to uncover potential heterogeneity in the effects of environmental shareholder activism by examining the role of the sponsor and the content of shareholder proposals.

The shareholder base can be loosely divided into institutional investors and noninstitutional investors. Institutional investors, such as asset management funds, hedge funds, mutual funds, and public pension funds, have significant resources and substantial shareholdings in portfolio companies, making them more active monitors compared to noninstitutional investors, such as individuals and labor unions. Institutional investors often have dedicated stewardship teams responsible for engaging with portfolio companies and form alliances and networks, such as Climate Action 100+, to amplify their influence and elevate the probability of successful engagement. Consequently, shareholder proposals filed by institutional investors tend to garner more support and prompt greater climate disclosures at the firm level (Flammer et al., 2021). Chen et al. (2020) also provide evidence of a causal effect of increasing institutional ownership on firms' corporate social responsibility (CSR) performance, with CSR-related shareholder proposals serving as one of the underlying channels of influence. In fact, both investors and academics surveyed by Stroebel and Wurgler (2021) view pressure from institutional investors as the most influential financial mechanism for reducing firms' climate risks.

Given the reasons above, it is plausible to hypothesize that environmental shareholder activism initiated by institutional investors is more likely to foster green innovation among firms. To test this hypothesis, we conduct separate 2SLS regressions for shareholder proposals filed by institutional investors. To differentiate between environmental shareholder activism led by institutional investors and noninstitutional investors, we adopt the approach employed by Flammer (2021) and identify the proponents. Following Flammer et al. (2021), we categorize public pension funds, ESG funds, special interest investors, and asset management funds as institutional investors, while retail investors, labor unions, religious groups, and others are classified as noninstitutional.

In Panel A of Table 3.5.2, we present the results for institutional shareholders, which consistently yield negative coefficients with larger absolute values compared to the baseline estimates in Panel A of Table 3.5.1. These findings indicate that firms actually produce fewer green patents when environmental shareholder activism is initiated by institutional investors. While this result may initially seem surprising, it aligns with the findings of Gao and Li (2021), who demonstrate that external environmental pressures from socially responsible-oriented state pub-

lic pension funds result in green patents of lower quality, despite public pension funds typically being regarded as long-term investors.

The subject of environmental shareholder proposals extends to a large array of topics, but not all environmental issues carry equal importance across industries. The Sustainability Accounting Standards Board (SASB) has developed industry-specific standards to identify the sustainability information that is financially material from an investor's perspective. Previous studies have demonstrated that only material environmental issues are value-enhancing for shareholders compared to immaterial issues (Grewal et al., 2016; Khan et al., 2016). When faced with pressure from institutional investors, firms tend to prioritize improving financially material CSR issues (Chen et al., 2020). Therefore, in our analysis, we distinguish between shareholder proposals that address financially material issues and those that do not.

We classify shareholder proposals as financially material according to the SASB industry standards.[13] Out of the 26 ESG topics covered by SASB, we only consider environment-related issues. Specifically, we exclude issues related to Social Capital and Human Capital, while assessing topics under Business Model & Innovation and Leadership & Governance on an industry-specific basis.

Shareholder proposals requesting the publication of sustainability reports are categorized as immaterial in this study. These proposals tend to be generic and broad in nature, making it challenging to justify their materiality across diverse industries and companies. Furthermore, these proposals primarily emphasize disclosure rather than concrete actions. While disclosure can influence corporate behavior, it represents a step removed from direct shareholder governance.

The results are reported in Panel B of Table 3.5.2. For financially material proposals, the coefficients drop below our baseline estimates in Panel A of Table 3.5.1, meaning that firms are more likely to reduce green innovation activities when shareholders touch upon financially material issues. This could potentially be explained by the cost-benefit consideration for firms. As noted by Grewal et al. (2016), addressing material sustainability issues requires fundamental changes in the companies' business models, making the costs of implementing green innovation initiatives considerably higher, potentially outweighing the short-term benefits. Thus, firms may opt for alternative, less costly measures to satisfy shareholders, such as increased sustainability disclosure firms.

[13]SASB materiality finder: `https://www.sasb.org/standards/materiality-finder/?lang=en-us`

Table 3.5.2. Heterogeneous effects of environmental shareholder proposals on green innovation(2SLS)

Panel A: Environmental shareholder proposals filed by institutional investors

Dependent Variables:	Green Patent$_{t+1}$ (1)	Green Patent$_{t+2}$ (2)	Green Patent$_{t+3}$ (3)	Green Patent Citations$_{t+1}$ (4)	Green Patent Citations$_{t+2}$ (5)	Green Patent Citations$_{t+3}$ (6)
Institut.Env.Proposal(instr.)$_t$	-0.09*	-0.14**	-0.10*	-0.23*	-0.32**	-0.25*
	(0.05)	(0.06)	(0.06)	(0.14)	(0.13)	(0.13)
Log(1+assets$_t$)	0.09***	0.11***	0.13**	0.18***	0.17**	0.20*
	(0.03)	(0.04)	(0.05)	(0.06)	(0.08)	(0.11)
Book-to-market$_t$	0.01	-0.02	-0.04	0.04	-0.04	-0.07
	(0.02)	(0.04)	(0.05)	(0.06)	(0.09)	(0.10)
ROA$_t$	0.01	0.04	0.11	0.05	0.10	0.30
	(0.04)	(0.09)	(0.14)	(0.11)	(0.24)	(0.36)
Log(1+emissions$_t$)	0.01	0.03**	0.03	0.01	0.07**	0.06*
	(0.01)	(0.01)	(0.02)	(0.03)	(0.03)	(0.04)
Institutional ownership$_t$	-0.04	0.07	0.27**	0.15	0.39	0.76**
	(0.07)	(0.10)	(0.13)	(0.18)	(0.24)	(0.30)
Log(1+R&D expenses$_t$)	0.03	0.02	0.02	-0.005	-0.05	-0.08
	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)	(0.06)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,221	5,884	4,658	7,221	5,884	4,658
R^2	0.91	0.94	0.96	0.84	0.90	0.93
Within R^2	0.006	0.007	0.01	0.001	0.002	0.009

Panel B: Environmental shareholder proposals that are financially material

Dependent Variables:	Green Patent$_{t+1}$ (1)	Green Patent$_{t+2}$ (2)	Green Patent$_{t+3}$ (3)	Green Patent Citations$_{t+1}$ (4)	Green Patent Citations$_{t+2}$ (5)	Green Patent Citations$_{t+3}$ (6)
Material.Env.Proposal(instr.)$_t$	-0.16*	-0.25**	-0.16*	-0.41*	-0.59***	-0.39*
	(0.09)	(0.10)	(0.09)	(0.24)	(0.22)	(0.21)
Log(1+assets$_t$)	0.09***	0.11***	0.12**	0.18***	0.16**	0.19*
	(0.03)	(0.04)	(0.05)	(0.06)	(0.08)	(0.11)
Book-to-market$_t$	0.02	-0.02	-0.04	0.04	-0.03	-0.06
	(0.02)	(0.04)	(0.05)	(0.06)	(0.09)	(0.10)
ROA$_t$	0.009	0.03	0.11	0.04	0.09	0.29
	(0.04)	(0.09)	(0.14)	(0.11)	(0.24)	(0.36)
Log(1+emissions$_t$)	0.01	0.03**	0.03	0.01	0.07**	0.06*
	(0.01)	(0.01)	(0.02)	(0.03)	(0.03)	(0.04)
Institutional ownership$_t$	-0.04	0.08	0.28**	0.16	0.42*	0.78***
	(0.07)	(0.10)	(0.13)	(0.18)	(0.24)	(0.30)
Log(1+R&D expenses$_t$)	0.03	0.02	0.02	-0.006	-0.06	-0.08
	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)	(0.06)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,221	5,884	4,658	7,221	5,884	4,658
R^2	0.90	0.94	0.96	0.84	0.904	0.93
Within R^2	0.001	-0.001	0.008	-0.002	-0.003	0.004

Notes: The dependent variables on green patents are adjusted for truncation bias. Standard errors clustered at the firm level are in parentheses. *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively. Intercepts are omitted.

3.5.3 Robustness checks

We perform the following robustness checks for the main specification of our two-stage least squares regression. The results remain largely unchanged when (a) we test the sensitivity of the instrument, environmental activism wave, to the threshold selected (in terms of the number of proposals) by changing the cutoff from five to three proposals, (b) we use an alternative definition of green patent, focusing on climate-related patents only, (c) we run the analysis using raw patent variables as the outcome variable (without adjustment for truncation bias), (d) we tease out those industries that are unlikely to engage in green innovation and include only industries that have filed at least one green patent in our analysis, (e) we exclude firms that have never developed a patent from our analysis, and (f) we restrict the sample to firms that are targeted by environmental proposals during the sample period since the instrument only exists for companies that have received environmental shareholder proposals.

3.6 Conclusion

In this paper, we investigate the effect of environmental shareholder activism on companies' green innovation. We do not find sufficient statistical evidence that supports a positive effect. On the contrary, our empirical results suggest that companies reduce their green innovation output after being targeted by shareholder activists, although more studies on this subject are warranted. Our results are consistent with von Schickfus (2021) who finds no influence of institutional ownership on corporate green innovation and Bolton et al. (2022) who find very weak effect of investor pressure on mobilizing companies to redirect their innovation activities towards green technologies. The fact that corporations react negatively to environmental shareholder proposals is in line with the frequent negative reaction or lack of any reaction from the stock markets because a shareholder proposal signals that a shareholder could not negotiate a behind-the-scenes agreement with management (McCahery et al., 2016).

We identify three main possible reasons for the ineffectiveness of filing environmental shareholder proposals in facilitating the generation of green patents. First, investors lack awareness of the importance of green innovation in addressing climate change. The agency problem prevails when shareholders fail to monitor this key ingredient of the green transition. We observe that shareholder proposals are mostly concentrated on disclosure and target setting—the word "innovation" rarely occurs in the proposal texts. He et al. (2023) classify E&S shareholder proposals

into three categories (i.e. action, disclosure, and others), and more than 50% of the total E&S 1658 proposals in their sample centre around disclosure. Second, the market does not reward firms' efforts related to green innovation either with higher ESG scores (Cohen et al., 2021) or higher firm valuation (Andriosopoulos et al., 2022). Naturally, given the lack of incentives, companies choose to devote their resources to areas that are more visible to investors and less costly for managers. In the same spirit, Li (2022) finds that firms exposed to physical climate risks are more likely to adapt by adjusting their existing operations (business-as-usual) rather than by making a shift in business strategies, including those associated with capital expenditure and R&D activities. Third, in the context of shareholder activism, managers face time constraints. Given that proxy voting takes place annually, shareholders tend to follow up on unresolved issues by filing a new proposal next year. Companies have a relatively short period of time to take action between proposals, which could possibly lead to short-termism in addressing environmental challenges.

Our paper raises the alarm about the real effects of environmental shareholder proposals. Although it may increase information efficiency in the market (Flammer et al., 2021; He et al., 2023), the hope of generating real-world impact is impeded by its current practice. Our paper echoes Heath et al. (2022) who attributed the success of socially responsible investment to a selection effect, not a treatment effect. While investors boast a high success rate of their engagement efforts (Dimson et al., 2015; Barko et al., 2021; Bauer et al., 2022b), it's worth noting that vaguely defined success does not equate real-world impact. Setting the right expectations is critical for both regulators and practitioners.

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3.A Variable descriptions

Variable	Definition	Source
# Env. shareholder proposal	The number of environmental shareholder proposals filed at a firm; shareholder proposals categorized as environmental according to Insightia and Ceres plus inspection of proposal texts.	Insightia, Ceres, hand-collected
# Env. shareholder proposal - institutional investors	The number of environmental shareholder proposals filed by institutional investors at a firm; institutional investors including public pension funds, ESG funds, special interest investors, and asset management funds.	Insightia, Ceres, hand-collected
# Env. shareholder proposal - financially material	The number of environmental shareholder proposals filed at a firm that are deemed financially material according to SASB industry standards.	Insightia, Ceres, SASB, hand-collected
# Green patents	The total number of a firm's green patents adjusted for truncation (Hall et al., 2001, 2005).	USPTO, Stoffman et al. (2022)
# Green citations	The total number of citations received by a firm's green patents adjusted for truncation (Hall et al., 2001, 2005).	USPTO, Stoffman et al. (2022)
Green patent ratio	The proportion of green patents in a firm's total patents.	USPTO, Stoffman et al. (2022)
# Avg. citation of green patents	The average number of citations received by the green patents that are applied by a firm.	USPTO, Stoffman et al. (2022)
Log(1+assets)	The natural logarithm of one plus a firm's total assets.	CRSP-Compustat Merged Database
Book-to-market	The ratio of book value of assets over market value of equity plus book value of debt.	CRSP-Compustat Merged Database
Return-on-asset	Net income scaled by total assets.	CRSP-Compustat Merged Database
Institutional ownership	The percentage of outstanding shares owned by institutional investors.	Refinitiv
Log(1+emissions)	The natural logarithm of one plus the total GHG emissions of the firm measured in equivalents of metric tons of CO2.	Refinitiv
Research & Development expenses	Measured as item XRD_t in millions U.S. dollars on a firm's income statement.	CRSP-Compustat Merged Database

3.B Example of environmental shareholder proposals: Amazon.com, Inc. 2019 Proxy Statement

Resolved: Shareholders request that Amazon's Board of Directors prepare a public report as soon as practicable describing how Amazon is planning for disruptions posed by climate change, and how Amazon is reducing its company-wide dependence on fossil fuels. The report should be prepared at reasonable expense and may exclude confidential information.

Supporting Statement: Amazon is both affected by and contributing to climate change. What is Amazon's plan to respond to climate change?

Science has established that climate change is causing overall increases in extreme weather intensity and frequency. Scientists are increasingly measuring climate change's contributions to individual weather events. Disruptions from climate change will increase and intensify without urgent action curtailing further warming. 2018's National Climate Assessment predicts hundreds of billions of dollars in annual economic losses in the United States, Amazon's largest market.

Extreme weather exacerbated by climate change poses great risks to Amazon's workers, customers, and infrastructure, and already impacts Amazon:

- June 2016: An AWS data center in Sydney, Australia went down during severe weather, which broke rainfall records.
- June 2017: Phoenix's airport cancelled flights during a record-tying heat wave. At 120 degrees, airplanes struggle to take off and land. Disrupted flights are expected to occur in more cities serviced by Amazon Air.
- Early 2018: Cape Town, South Africa is the site of Amazon's planned "AWS Africa" expansion. Facing severe drought, residents took drastic action to prevent a "day zero" when the city's taps would run dry.
- March 2018: A data center supporting AWS suffered a power outage during Superstorm Riley, disrupting Amazon Alexa.
- August 2018: Forest fire smoke enveloped Amazon's Seattle headquarters, where workers wore face masks to protect their health.
- September 2018: Flooding from Hurricane Florence disrupted production at the plant manufacturing 20,000 vans for Amazon's delivery service.

- November 2018: A tornado in Baltimore smashed an Amazon fulfilment center, ruined its merchandise, and killed two workers.
- November 2018: California's Camp Fire temporarily shuttered Amazon's Sacramento fulfilment center, delaying deliveries.
- November 2018: As part of "HQ2," Amazon selected Long Island City, Queens, which flooded during Hurricane Sandy.

Amazon is not a mere victim of climate change—its operations contribute significantly to the problem. The overwhelming scientific consensus is that burning fossil fuels is the major driver of climate change. To limit warming to the safer levels governments committed to in the Paris Agreement, scientists estimate that the world can only burn a fifth of existing fossil fuel reserves. Multiple industries will have to modernize to meet this mandate. Coal still powers Amazon data centers. Diesel, gasoline, and jet fuel still power package delivery.

Many of Amazon's peers, including Google, UPS, Walmart, and Target, have reported on climate change plans. Amazon's report could include time-bound, quantitative metrics for transitioning off fossil fuels at the speed and scale necessary to meet targets in IPCC's latest climate science report. Amazon can follow its leadership principle on "Ownership" to consider long-term climate risks.