ESG Choice with Polarized Investors*

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Abstract

We examine how the political polarization of individual investors, particularly regarding Environmental, Social, and Governance (ESG) issues, is reflected in corporate decision-making. The paper presents a theoretical model with two types of investors: those who prioritize ESG factors (activists) and those who do not (skeptics). It finds that large funds, seeking to attract investors of all ideologies, tend to adopt moderate stances on ESG, which they can impose on corporations. In a future with pass-through voting where individual investors vote directly, more-extreme corporate ESG policies are likely to be implemented reflecting the underlying polarization among investors. Additionally, the paper explores the influence of investment funds, shareholder abstention, and the potential role of "political entrepreneurs" in a pass-through voting system.

Keywords: ESG, Index Funds, Pass-Through Voting, Polarization.
JEL codes: G23, G30, P12.

1 Introduction

Companies frequently make politically controversial decisions, including on issues such as corporate environmental impact, social justice, or ethical business practices – a set of issues subsumed under the acronym ESG.[1] ESG issues often

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[1]The acronym stands for "environmental, social, and governance." Other politically controversial issues that are part of ESG include gender equality, CEO pay, human rights, privacy, health, and product safety.

touch on people's moral beliefs, and the public is sharply polarized on them. Today, US corporate leaders are "caught in the middle:" they are scrutinized by the left and the right for not doing enough ESG or for doing too much of it.

This public scrutiny highlights, in our view, a democratic deficit in corporate voting. Currently, corporate ESG choices are determined by the votes of large investment funds like Blackrock, Vanguard, and State Street, not by the individual investors who actually put up the money to buy the shares.[2] (This is because, technically, individual investors who invest through a mutual fund only own shares in the fund, whereas the shares in the fund's portfolio firms are owned *and voted by* the fund.) This democratic deficit has created pressure on fund managers to find a mechanism to delegate ESG choices back to individual investors.

The most popular such mechanism is "pass-through voting," which allows individual investors to have a say in how their shares are voted – even if the shares are owned through a mutual fund. Pass-through voting is designed to address a significant agency problem in financial intermediation: to allow the ultimate owners of the shares, i.e., the individual investors, to voice their views on corporate matters, including ESG.

In this paper, we are interested in predicting how pass-through voting will affect corporate ESG.[3] Specifically, we seek to explain why the political polarization that exists among citizens has not so far been reflected in corporate ESG choices (more on this statement below); and to predict whether introducing a pass-through voting mechanism will cause corporations to implement *more-polarized ESG policies*. To this end, we provide a theoretical model with the following features:

1. Individuals have polarized preferences over ESG: some are skeptics, others are activists.
2. Most individuals invest in the stock market through large mutual funds.
3. Individuals invest more if the ESG stance of the firms in their fund's portfolio's is aligned with their personal ESG preference.
4. Large mutual funds push for moderate ESG because, in order to maximize the value of assets under management, they want to make their portfolio attractive to both skeptic and activist investors.

[2]Institutional investors today hold about 80 percent of U.S. public equity and, through their voting and engagement activities, affect many central societal and political issues.

[3]In Section 8.2, we provide a definition of the pass-through mechanism we envisage.

5. When corporations are accountable to large fund managers, as is currently the case, corporations will implement the moderate ESG level sought by the large funds.

6. In a future where individual investors have access to pass-through voting, more-extreme ESG policies will be implemented, coinciding with the ideal ESG level of either the skeptics or the activists.

Stylized facts 1 through 5 support the claim that the political polarization among citizens has not so far been reflected in corporate ESG choices; these facts are documented in Section 2. Item 6 predicts that introducing a pass-through voting mechanism will cause corporations to implement *more-polarized ESG policies*; this prediction is derived analytically in Section 7, and its realism is discussed in Section 8. To our knowledge, this is the first paper that compares how the polarization of individual investor preferences determines the polarization of corporate policies under two regimes: the shares are voted by the mutual fund vs by the individual investors.

Our analysis shows that firms would invest differently in ESG if they responded to their individual investors' votes (pass-through voting) rather than to the large investment funds who currently vote their fundholder's shares. Indeed, because individual investors are polarized on ESG, pass-through voting would produce extreme policies: either little ESG or lots of it. Large funds, in contrast, prefer moderate ESG policies because they seek to attract both activist and skeptic investors. Thus, the equilibrium ESG level under pass-through voting would be more extreme, in either direction, than the moderate level preferred by large investment funds. In our view, therefore, the presence of large investment funds explains why, despite a polarized environment, corporate policy is moderate on politically charged issues. We predict that pass-through voting is likely to change that.

Our analysis also shows that multiple self-confirming equilibria may exist under pass-through voting – all of which feature extreme ESG stances. This multiplicity can arise because, in our model, share ownership is endogenous to the firm's ESG stance: skeptic and activist investors choose how many of a firm's shares to purchase as a function of the ESG stance the firm is expected to adopt in equilibrium. This stance, in turn, is endogenous to share ownership. Therefore, under pass-through voting, there may be multiple self-confirming equilibria.[4] We interpret this multiplicity of extreme equilibria as potential

[4]In particular, if skeptics and activists are roughly equally represented in the market,

instability which could, conceivably, incentivize both firm management and institutional investors to take actions in an effort to "select" one equilibrium over the other.

Pilot initiatives in pass-through voting are currently being undertaken by large investment funds.[5] These initiatives have implemented a version of pass-through voting in which the choices offered to investors are abstract "investment policies" – essentially, generic value statements according to which the fund commits to vote an investor's shares. So far, these investment policies have failed to engage investors (see Section 8.1); as a result, investor participation has been low, suggesting that these initiatives, in their current form, fail to redress the democratic deficit in corporate voting.[6] In the pass-through system we envisage, individual investors would give their proxies to trusted "political entrepreneurs." Such entrepreneurs would compete with each other by, presumably, making ESG issues more salient to investors in the same way that politicians compete for the voters' attention and trust. In such a pass-through system, awareness of corporate ESG and retail voting turnout would increase, but the tone of the ESG debate would become more political.

Our empirical premise that the ESG stance of large investment funds is moderate whereas individual investors are polarized, may appear counterintuitive. The fact is, however, that large investment funds are attacked from both sides of the political spectrum: BlackRock, for example, the largest asset manager in the world, was sued by eleven conservative U.S. states for pushing too hard on environmental practices and, on the same occasion, was publicly rebuked by the manager of New York City's public pension funds for doing too little on its climate commitments.[7] Such "bi-polar" attacks have become common,[8] suggesting that large investment funds are "in the middle" of the distribution of

two equilibria coexist: in one equilibrium, every investor expects the firm to implement the activists' ideal ESG level, which makes activists more inclined to purchase shares compared to skeptics, thus enabling the former to implement their ideal ESG level. In another equilibrium, every investor expects the firm to implement the skeptics' ideal ESG level, which makes shares relatively unattractive for activists, thus enabling the former to implement their ideal ESG level.

[5] These initiatives include Vanguard's *Investor Choice* pilot, BlackRock's *Voting Choice* program, and State Street's *Proxy Voting Choice* program. See Section 8.1 for further institutional detail.

[6] Individual investor participation in Vanguard's pass-through initiative has only been 2%: see Vanguard (2024).

[7] These events took place in November 2024. See Reuter's BlackRock, Vanguard, State Street sued by Republican states over climate push and New York City's comptroller press release.

[8] In another instance, in 2022 BlackRock was attacked by climate activists for doing too little ESG and by the state of Florida for doing too much of it.

societal ideal points regarding ESG. We further support this empirical premise in Section 2.4.

Finally, we discuss abstention in corporate voting. In the present system, even when given a chance via pass-through voting, most retail investors abstain from corporate voting.[9] Abstention, we contend, is not inherent to corporate voting: when the issues are made salient through a public opinion campaign, as Iger and Peltz did in the 2024 Disney proxy fight, the investor turnout rate can exceed 60%.[10] We argue that a properly designed pass-through system would resolve the issue of abstention (see Section 8.2) and, thus, redress the democratic deficit in corporate voting – at the cost, however, of increasing polarization.

To our knowledge, this is the first paper that explores how voting outcomes and firms' ESG stance would change if pass-through voting were implemented and the individual stock holders, rather than the financial institutions that formally own the stock, had the right to vote at firms' shareholder meetings.

Our paper contributes to several literatures. First, we contribute to the literature on shareholder voting in which at least some shareholders have social preferences. In their seminal papers, Hart and Zingales (2017) and Hart and Zingales (2022) put forward shareholder welfare, rather than value, maximization as the normatively correct corporate governance framework when shareholders are socially responsible and corporations have a comparative advantage over government in addressing externalities. On this issue, see also Rock (2020), Kahan and Rock (2023) and Fisch and Schwartz (2023). Starks (2023) points to the distinction between ESG investing that is driven by economic *value* vs moral *values*. In Starks (2023)'s language, our type-B investors are driven more by *value* compared to type-A investors, who are driven more by *values*. Relative to this literature, our paper stresses the *polarization* of individual investor preferences and how (or whether) it translates into corporate policies.

Like Pástor et al. (2021) and Pedersen et al. (2021), we study the implications of the shareholders' non-pecuniary motivations on portfolio allocations

[9] Regarding corporate voting, according to Brav et al. (2022), over the period 2015 to 2017 the retail investor voting rate varies between 3% for the bottom quintile account size and 15% for the top quintile account. Voting rate is defined as the number of ballots cast divided by the number of voting opportunities. As regards low participation in pass-through voting, see Vanguard (2024).

[10] To encourage individual investors to vote for the company's director slate, Disney ran an expensive public opinion campaign including a funny animated video. Nelson Peltz ran a countercampaign. As a result, roughly 60% of retail investors turned out across key votes, a very large turnout. An even higher turnout was recorded among Tesla retail investors in 2024 on the issue of Elon Musk's compensation. See FTI's report Retail Shareholders: The New Frontier of Shareholder Engagement.

and security prices. But they take the firms' ESG level as given, whereas in our paper it is endogenous (and the main object of interest). In Wu and Zechner (2024), the ESG level (referred to as "political preference") is endogenous, but they do not consider pass-through voting. Moreover, the ESG level that maximizes firm value is extremal in Wu and Zechner (2024), whereas it is moderate in our model. In sum, our paper has different predictions regarding the polarization of ESG and, also, innovates by analyzing pass-through voting as a system for determining ESG.

In our paper, the role of government is rather stylized; see Section 4.1. Döttling et al. (2024) study public goods provision when the political system interacts with corporate governance in the provision of public goods, while Carlson et al. (2022) study how the political and corporate arenas interact in determining asset divesting. Our main focus is not on governmental action but, rather, on how the corporate governance channel (including institutional investors) gives voice to political preferences.

In our paper, there is no question of aggregating dispersed information among investors: the differences among individual investors reflect preferences, not information. In an informational vein, but unrelated to ESG, Bar-Isaac and Shapiro (2020) deal with informational issues and abstention in corporate voting. Malenko and Malenko (2023) study the implications of pass-through voting in a setting in which, if individual investors vote their preferences, the superior information of institutional investors is not reflected in the outcome. Instead we, in line with Tallarita (2022), predict that, in a future with pass-through voting, individual investors will delegate their votes to knowledgeable political entrepreneurs who match their ESG preferences.

We discuss investor abstention and turnout. Van Wesep (2014) studies different governance mechanisms to increase the pivotality of each vote and thus turnout. The turnout-promoting mechanism we propose in Section 8 does not revolve around pivotality: instead, we propose that investors be allowed to delegate to people, rather than to choose from abstract investment policies.

Our paper is consistent with several strands of the relevant empirical literature. Some empirical papers study the turnout and voting behavior of retail investors who hold stocks directly: see Brav et al. (2022), Zytnick (2022), and Jackson and Zytnick (2024). Other papers estimate the non-pecuniary preferences of retail investors through surveys: see Bonnefon et al. (2025), Hart et al. (2024), Giglio et al. (2023), Kempf and Spalt (2024), and Montagnes et al. (2024). A related branch of the literature studies the implications of

the shareholders' non-pecuniary motivations on security prices: see Hong and Kacperczyk (2009), Pástor et al. (2022), and Pedersen et al. (2021). Consistent with the results in these papers, our model predicts that socially responsible investors prefer stocks with higher ESG levels rather than investing in brown stocks where they can have more impact (see Hartzmark and Shue (2022)) and that such demand causes higher prices for ESG stocks.

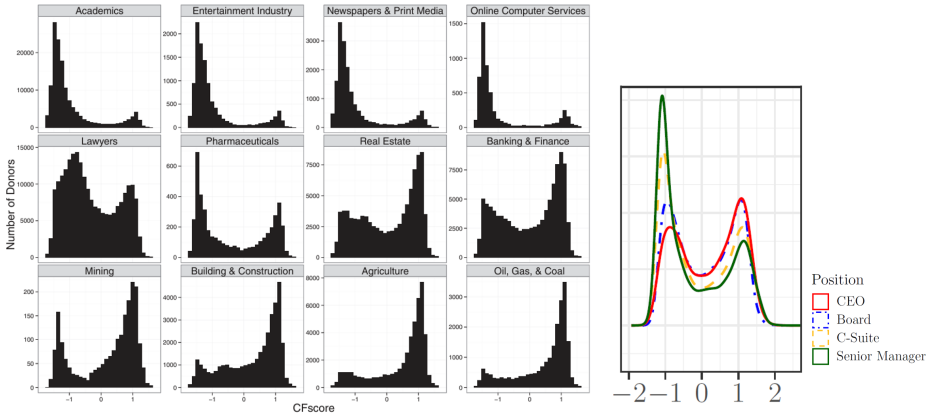
We assume, in line with Bebchuk and Hirst (2019) and Hirst and Bebchuk (2022), that large mutual funds have the power to impose their preferences on their portfolio firms. A contribution of our paper is to derive a motive for the ESG stance of both large and small investment funds, based on individual investor preferences and market structure. We find that large funds are moderate on ESG, but small funds are polarized. Bolton et al. (2020), Bubb and Catan (2022), and Herrmann et al. (2024) document the heterogeneity in the investment funds' voting patterns; Bolton et al. (2020) further show that large funds are moderate on ESG, whereas small funds are polarized. We propose a rationale (maximize the value of assets under management) that explains the moderate voting behavior of large investment funds and the polarized voting behavior of small ones.

2 Stylized facts

2.1 Individuals have polarized preferences over ESG

American citizens are politically polarized. Bonica (2014) develops a methodology to estimate individual citizens' ideal points from their campaign contributions drawn from the FEC database. The methodology is based on the assumption that contributors allocate their funds to politicians close to them in ideology. Figure 1(a), reproduced from Bonica (2014), shows high levels of political polarization within professions. The finding that U.S. citizens are very polarized is consistent with Desmet et al. (2024), who find that citizens are even more polarized than politicians. This evidence suggests that American citizens are politically polarized. Not surprisingly, perhaps, individual members of corporate boards are polarized also: using a methodology similar to Bonica (2014), Steel (2024) finds that individual board members are politically polarized (Figure 1b).

The above paragraph restricts attention to political polarization. Going from political polarization to ESG polarization is a short step, in our view. Indeed,



(a) Ideological position of citizens

(b) Ideological position of individual corporate officers

Figure 1: High political polarization among citizens (panel 1a) and individual board members of the top 4,000 U.S. corporations (panel 1b). Sources: Bonica (2014) and Steel (2024).

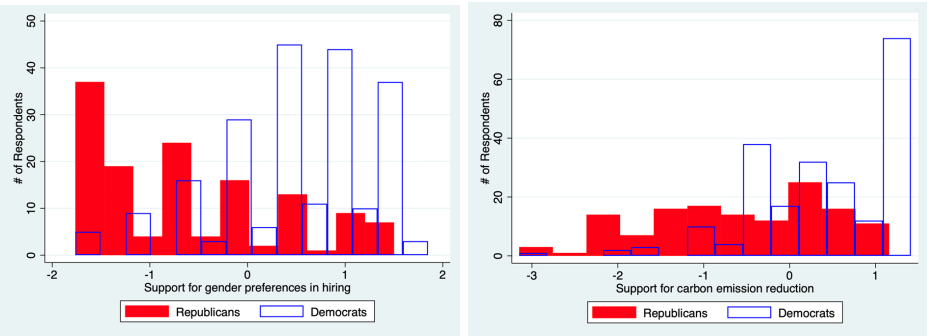
on many ESG-relevant topics, political partisanship is a strong predictor of ESG attitudes. Specific examples are easy to come by: on the environment, for instance, which is a central ESG issue, when asked about how important is "global warming as a voting priority," 70% of respondents who identify as liberal democrats say it is "very important" vs only 8% of conservative republicans.[11] More systematically, political partisanship has been shown to strongly predict support for a great number of the shareholder resolutions typically put to a vote (Montagnes et al., 2024)[12] and, also, shareholder voting on the part of individuals who own stocks directly (Jackson and Zytnick, 2024).

In the same vein, but without restricting our language to that of shareholder resolutions, we survey retail investors to elicit their support for ESG policies that might lead them to buy or sell shares, including gender preferences in hiring and carbon emission reduction; Figure 2 shows that responses are strongly polarized by partisan affiliation. Moreover, we present new evidence concerning willingness to invest. In an incentivized survey design, we give respondents the choice to invest either in a fund entirely focused on financial returns or

[11] See Leiserowitz et al. (2024).

[12] When asked in the context of proxy voting for a hypothetical "company XYZ," survey respondents' support for or opposition to ESG policies is strongly predicted by political partisanship. See Figure 2 in Montagnes et al. (2024).

Individual investors are polarized on ESG stance



(a) Support for gender preferences in hiring **(b)** Support for carbon emissions reduction

Figure 2: High political polarization among individual investors on gender (panel a) and climate (panel b) issues. Self-identified Democrats (blue bars) are much more likely than Republicans (solid red bars) to support gender preferences in hiring and carbon emissions reduction. Appendix B provides information about the survey and the construction of this figure.

in one with the same returns that uses a fraction of its returns to purchase carbon offsets. Figure 3 shows that most Republicans opt for the first fund, and most Democrats opt for the second. These results complement Bonnefon et al. (2025), who also incentivize the respondents but structure the question slightly differently.

In sum, we believe that political polarization is a good proxy for ESG polarization.

2.2 Most individuals who invest in the stock market do so through large mutual funds

Most U.S. households' investments in the stock market take place through retirement plans,[13] which in turn invest their assets through mutual funds – mostly large ones. In fact, the mutual fund sector is highly concentrated: the top five mutual fund families make up 63% of US fund assets under management.[14] Accordingly, large mutual funds wield great power in corporate governance mat-

[13] According to the 2022 Survey of Consumer Finances, approximately 60-65% of household stock market investments are held in retirement plans.

[14] See Stankiewicz and Hughes (2024). The top five families are Vanguard, BlackRock, Fidelity, Capital Group, and State Street.

Individual investors are polarized on ESG investment

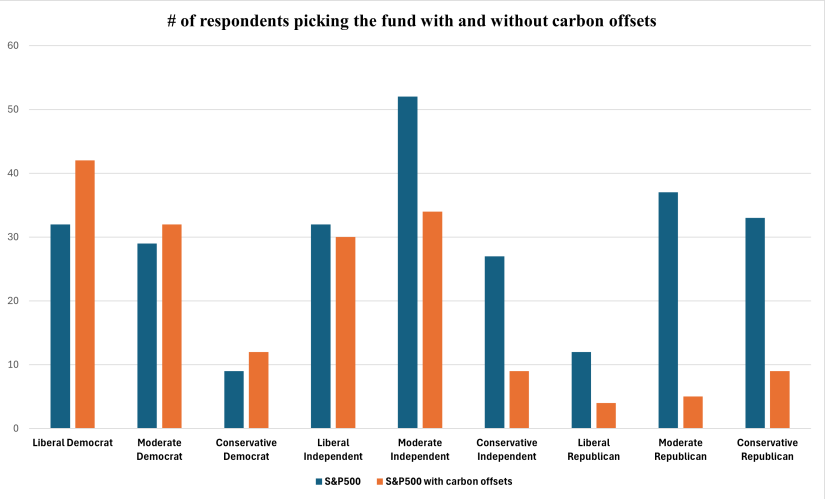


Figure 3: High polarization on ESG investment among individual investors. Stronger self-identification with Republicans (right-hand side of the graph) is associated with a higher likelihood to pick the purely return-oriented fund (S&P 500, teal bar) over the environmentally conscious fund (S&P 500 with carbon offsets, orange bar). Appendix B provides information about the survey and the construction of this figure.

ters.[15]

Furthermore, our model assumes that investors in large funds are "captive" (in the sense of Section 6). This assumption is broadly correct: indeed, typically, employees have no control over the mutual fund family (often, it is just a single family) their retirement plan offers. And, even when more than one fund family is available, individual investment allocations in retirement plans are famously sticky: inertia in allocations has been well documented.[16] This behavior, which is indicative of high switching costs, suggests that most U.S. individual investors are "captive" of the mutual funds selected by their employer (in the sense of Section 6).

[15] See Bebchuk and Hirst (2019) and Hirst and Bebchuk (2022).
[16] See Madrian and Shea (2001), Agnew et al. (2003).

2.3 Individuals invest more if the ESG stance of the firms in their fund's portfolio is aligned with their personal ESG preference

There are two different theories of how ESG-sympathetic individuals should and do invest in the stock market. The impact-investing theory is that pro-ESG individuals should invest the most in "brown" companies because these companies are the "most improvable" ones – and those where the pro-ESG investor's voice is going to make the most positive difference. Against this theory stands the "warm glow" theory, which holds that individual investors derive utility from investing in companies that practice ESG. According to the warm glow theory, pro-ESG investors are expected to invest more in "green" companies.

Our theory is of the warm-glow variety because we assume that individual investors preferentially buy shares, or portfolios, in companies whose ESG stance is more aligned with their moral preferences. Empirical evidence consistent with this assumption is provided by Haber et al. (2022) and Hong and Kostovetsky (2012).[17] Along the same lines, Giglio et al. (2023) report that individual Vanguard investors with the highest ESG portfolio holdings say that investing in ESG portfolios is "the right thing to do." Also consistent with warm-glow preferences (and with our theory), corporate CEOs and fund managers publicize their ESG stances, presumably in an effort to attract individual and institutional investors to their firm or fund who are attuned with the publicized ESG stance.

2.4 Large mutual funds push for moderate ESG

In this section, the word "push" refers informally to large funds' votes and their engagement activities.[18] This section makes two related statements. First, large funds push for moderate positions *compared to smaller funds*, who are both to the left and the right of large funds. Figure 4 supports this view. The figure plots the distribution of ideal points over the ideological line spanning socially

[17] Haber et al. (2022) write that "shareholders across all demographic groups express a desire that their fund managers vote their shares in accordance with their (the investors') personal views." Hong and Kostovetsky (2012) write "mutual fund managers who make campaign donations to Democrats hold less of their portfolios (relative to non-donors or Republican donors) in companies that are deemed socially irresponsible."

[18] Engagement refers to the direct interactions between mutual funds and the companies they invest in to influence corporate behavior, governance, and strategy.

oriented funds (on the left) to financial return-focused funds (on the right).[19] The largest five families – Vanguard, BlackRock, Fidelity, Capital Group, and State Street – are located around the middle of the ideological line, whereas funds at either extreme are relatively small.

The other statement is that large funds' ESG stances lie close to the *individual investors'* median ideal point. There is some disagreement in the literature on this issue. On the one hand, Montagnes et al. (2024) argue that large funds' voting guidelines are to the right (i.e., less favorable to ESG) of most survey respondents' ideal points. On the other, Giglio et al. (2023) report that a full 45% of Vanguard individual investors say that "there is no specific reason to invest in ESG portfolio," and only 25% say that investing in ESG portfolios "is the right thing to do."[20] Assuming that this investor population is somewhat representative, then large funds like BlackRock that do significant ESG engagement with companies[21] cannot be much to the right of the median individual investor's ideal point. In our view, the most persuasive evidence that large funds take a moderate stance on ESG compared to individual investors is that they are targeted by partisan politicians both on the left and on the right – refer to footnote 7. This suggests that their position is, indeed, moderate relative to the positions of partisan politicians. If individual investors' ideal points are similar to those of politicians,[22] then it is likely that large funds' ESG stances lie in the middle of the distribution of the individual investors' ideal points.

Why do large mutual funds push for the corporations they invest in to be moderate on ESG? For two reasons, we think. First, large investment funds face societal pressures to divest from companies whose ESG level is outside of societal expectations. Second, and closer to our theory, because adopting an extreme position would lose them customers. There is some indirect evidence that customers are at least aware of the ESG stances of large funds because non-captive customers sort, to some degree, among large funds – see Haber et al. (2022).

[19] The figure is based on an analysis of fund families' proxy voting patterns. It is adapted from Bolton et al. (2020).

[20] Another 30% find financial-motivated reasons to invest in ESG portfolios.

[21] See BlackRock (2024).

[22] In fact, recent evidence suggests that citizens' policy preferences are even more extreme than the policy platforms of parties: see Desmet et al. (2024). This evidence further strengthens our argument.

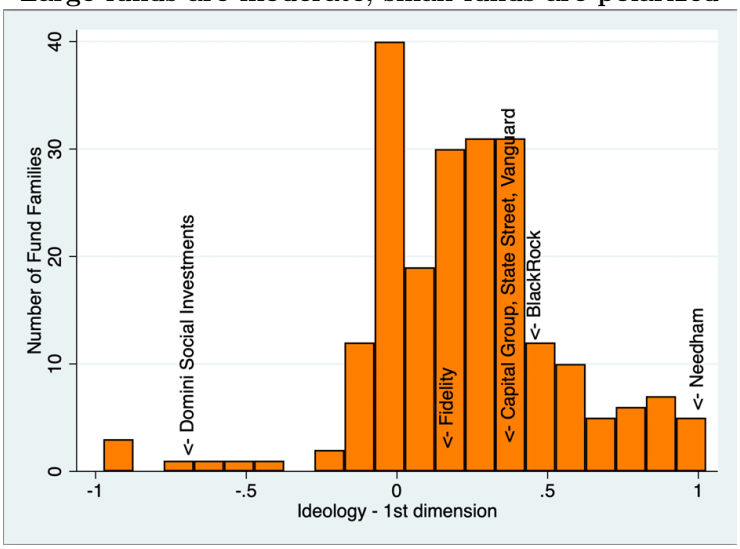


Figure 4: Ideal point of investment fund families. The largest fund families (Fidelity, Capital Group, State Street, Vanguard, and BlackRock) are in the middle of the distribution; the smaller fund families are at the extreme. Domini and Needham are smaller funds that are perceived as very pro-ESG and very return-oriented, respectively. Fund ideal points from Bolton et al. (2020). The horizontal axis captures the funds' social orientation.

2.5 Under pressure from large funds, corporations adopt a moderate ESG stance

It is widely accepted that the composition of U.S. boards is in line with the preferences of large asset managers.[23] So, it is telling that despite the individual-level polarization of corporate officers and board members shown earlier in Figure 1b, boards are constituted in such a way that their average ideology is politically centrist. Indeed, Steel (2024) computes a board's ideological position as the average ideological position of its members and shows that boards as a whole are moderate relative to their members (Figure 5, in contrast with Figure 1b). Since board composition is predominantly shaped by large institutional

[23] Usually, this alignment happens without open conflict between management and investors. Sometimes, conflict spills out in the open – in which case large asset managers tend to win. For example, State Street's campaign for gender diversity on corporate boards was acquiesced to by most of the companies in its portfolio: see Gormley et al. (2023). Occasionally, the conflict escalates into proxy fights. For example, in the 2021 ExxonMobil proxy fight, management was unable to prevent three pro-ESG directors from being appointed to the board who were proposed by investment firm Engine No. 1 and supported by BlackRock, Vanguard, and State Street: see "Exxon's Board Defeat Signals the Rise of Social-Good Activists".

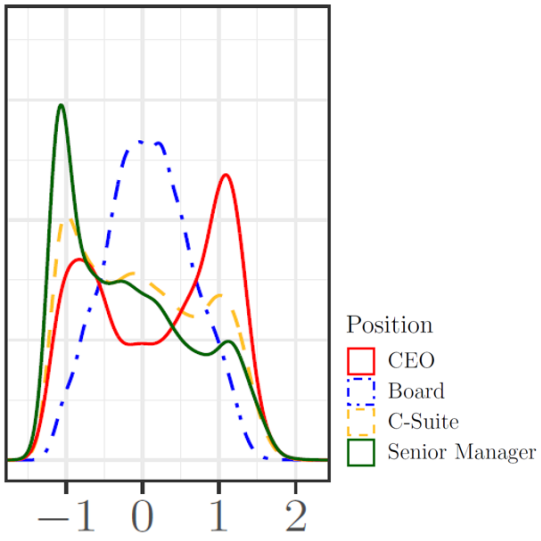


Figure 5: Ideological position of boards-as-a-whole (blue dash-dotted line). The ideological position of boards-as-a-whole are more moderate than individual corporate officers (refer to Figure 1b). Source:: this figure is based on the same data as Figure 1b and is reproduced from Steel (2024).

investors, we consider the boards' moderate composition evidence that large investors intentionally seek to create moderate boards.

3 Model

There is a single firm (the analysis is extended to many firms in Section 5). A random variable Y with positive mean $\mu(e)$ and variance σ^2 represent the firm's profits. The variable $e \in \mathbb{R}$ represents the amount of ESG implemented by the corporation.[24] The function $\mu(\cdot)$ is differentiable and concave with an interior maximum, meaning that there is a profit-maximizing ESG level. While the model accommodates the scenario in which profits peak at $e = 0$, meaning that ESG harms profits, this is not a required assumption in our analysis: we allow, for example, for profits to peak at a strictly positive ESG level.

There is a continuum of agents/investors of types $t = A, B$ with positive mass m_A and m_B, respectively. A total amount of shares $Q^T > 0$ is available for purchase on the stock market.

[24] We allow for the possibility that $e < 0$, which is interpreted as "negative ESG."

Agents have mean-variance utility over the firm's profits with risk aversion parameters r_A and r_B, depending on their type. In addition to profits, investors derive a moral benefit from owning shares which depends on the firm's ESG level.

Assumption 1 (**investors' moral preferences over shareholding**)**.** Agent t's moral benefit from owning q shares is $q \cdot h_t(e)$. The functions $h_t(\cdot)$ are differentiable and concave.

Assumption 1 has a consequentialist flavor in the sense that an investor's moral benefit of owning shares depends on what ESG the firm actually implements, not on how the investor's shares are voted. Also, Assumption 1 says that the investor's moral benefit is proportional to her share ownership. The special case $h_t(\cdot) \equiv 0$ captures type t's who do not have any moral preference.

Let $q \geq 0$ denote a quantity of shares of Y, and p a price-per-share. Under Assumption 1, a type-t investor who purchases q shares at price p has utility:

$$u_t(p, q; e) = q \cdot \mu(e) - r_t (q \cdot \sigma)^2 - p \cdot q + q \cdot h_t(e). \tag{1}$$

Agent t's ideal ESG level is:

$$\arg\max_e u_t(p, q; e) \stackrel{\text{def}}{=} \widehat{e}_t. \tag{2}$$

We assume that $\widehat{e}_t$ is finite for all t. Conveniently, $\widehat{e}_t$ is independent of (p, q) for any $q > 0$. Next, we stipulate that type A's value ESG more than type B's.

Assumption 2 (**single-crossing**)**.** $h_A(\widehat{e}_B) = h_B(\widehat{e}_B)$ and $h'_A(e) > h'_B(e)$ for all $e \geq \widehat{e}_B$.

Assumption 2 is a single-crossing assumption: it implies that, for all $e > \widehat{e}_B$, $h_A(e) > h_B(e)$, so that type A's have a higher *marginal and absolute* value for ESG than type B's. This assumption implies that $h_A(\cdot)$ peaks to the right of $h_B(\cdot)$: formally, that $\widehat{e}_A > \widehat{e}_B$. Intuitively, Assumption 2 means that type A's derive more moral benefit from ESG than type B's.

Demand for shares Because each agent is small (measure zero) relative to the firm, agents take the ESG level e as given when choosing their preferred stock quantity. Agent t maximizes her utility function (1) with respect to q, which yields the following first order conditions:

$$\mu(e) + h_t(e) - p - 2r_t q \cdot \sigma^2 = 0.$$

Solving for q yields the optimal quantity of Y purchased by investor t:

$$q^t(p;e) = \frac{1}{2\sigma^2 r_t} \max\left[\mu(e) + h_t(e) - p, 0\right]. \tag{3}$$

The max operator ensures that demand is nonnegative. Type t's aggregate demand is

$$Q^t(p;e) = m_t \cdot q^t(p;e). \tag{4}$$

Market clearing price For a given ESG level e, the equilibrium price p^* must clear the market for shares. Formally, the market clearing condition reads:

$$Q^A(p^*;e) + Q^B(p^*;e) = Q^T. \tag{5}$$

We are now ready to define a stock market equilibrium given e.

Definition 1 (Definition of stock market equilibrium given e). A price p^* that solves (5) together with the demand system given by (4) is a stock market equilibrium given e.

Parameter restrictions Because $Q^t(p;e)$ is decreasing in p for any e, if there is a price that solves equation (5), the solution is unique. A nonnegative solution exists if and only if $Q^T \leq Q^A(0;e) + Q^B(0;e)$. We make this assumption and thereby ensure that, for any constellation $(\frac{m_B}{r_B}, \frac{m_A}{r_A}, e)$, the stock market equilibrium price given e exists, is unique, and is nonnegative.

For reasons of realism and analytical convenience, we want to ensure that, for all values of m_B between zero and infinity, the equilibrium price is strictly positive, and B types purchase some shares in equilibrium. Accordingly, we restrict attention to parameter constellations where, for all $e \in [\widehat{e}_B, \widehat{e}_A]$, the equilibrium price is positive even if there are no type B's, i.e., if $m_B = 0$. This requirement is satisfied if Q^T is not too large.[25] This restriction ensures that the market clearing condition (5) holds with equality. In addition, we restrict attention to parameter constellations such that for all $e \in [\widehat{e}_B, \widehat{e}_A]$, aggregate demand of type B is strictly positive in equilibrium. This restriction holds if the total amount of available shares for sale Q^T is large enough so that type B's are never "priced out of the market."[26] This second restriction allows us to

[25] This restriction amounts to the requirement that type A's aggregate demand at its least buoyant (which happens when $e = \widehat{e}_B$) exceeds Q^T if the price equals zero. Therefore, we require $\frac{m_A}{2\sigma^2 r_A}[\mu(\widehat{e}_B) + h_A(\widehat{e}_B)] > Q^T$.

[26] This restriction amounts to the requirement that type A's aggregate demand at its most

dispense with the max operator in equation (3).

3.1 Discussion of modeling assumptions

Two types only There are only two types in the model, A and B, so the type distribution is discrete. This discrete type distribution is intended as an approximation of a continuous type distribution that is bimodal, i.e. where, like in Figure 1a, agents are concentrated at either extreme of the type distribution, and relatively few agents have "intermediate" or "moderate" types. What is ultimately important for the analysis are two properties: that mean and median investor type be different because this difference drives the difference between the ESG outcomes that arise in Sections 4.2 and 4.3; and that the median investor's ideal policy be "extreme" relative to the mean, capturing the polarization among retail investors. The two-type distribution is the simplest distribution with these two properties, which allows the model to speak to polarization vs. moderation of ESG policies and their impact on stock value.

Interepreting type B's ideal point Our model makes no assumption about the location of type A's and B's ideal points in ESG space except to say that the former want more ESG than the latter. It is within the model's scope to interpret type B's ideal point as "some ESG even if it's unprofitable," "no ESG unless it is profitable," or "no ESG even if some ESG is profitable."

Deontological moral preferences As discussed on page 15, Assumption 1 has a consequentialist flavor: an investor's moral benefit of owning shares depends on what ESG level the firm actually implements, not on how the investor votes her shares. There is no analytical difficulty in extending the model to include deontological preferences. This could be done by augmenting the function h_t with a second argument η that represents how the agent's shares are voted, so that the new function $h_t(e, \eta)$ captures both a consequentialist and a deontological motive. We opted to go with the more streamlined model only for

buoyant (which happens when $e = \widehat{e}_A$) induces an equilibrium price at which some type B will want to purchase shares even if type B's demand is the weakest (which happens when $e = \widehat{e}_A$). In other words, we want conditions such that $Q^A(p^*; \widehat{e}_A) = Q^T$ implies $Q^B(p^*; \widehat{e}_A) > 0$, which contradicts the hypothesis that an equilibrium exists in which only type A's purchase shares. Rewriting, we need conditions such that $\frac{m_A}{2\sigma^2 r_A}[\mu(\widehat{e}_A) + h_A(\widehat{e}_A) - p] = Q^T$ implies $\mu(\widehat{e}_A) + h_B(\widehat{e}_A) - p > 0$. Rewriting, we need conditions such that $[\mu(\widehat{e}_A) - p] = 2\sigma^2 \frac{r_A}{m_A} Q^T - h_A(\widehat{e}_A)$ implies $\mu(\widehat{e}_A) - p > -h_B(\widehat{e}_A)$. Therefore, the condition we seek is: $Q^T > \frac{m_A}{2\sigma^2 r_A}[h_A(\widehat{e}_A) - h_B(\widehat{e}_A)]$.

expositional simplicity.

Incentives to vote are second-order Although the firm's ESG stance is a first-order driver of an agent's decision to *buy* shares (see expression 1), the incentive to *vote* one's share is a second-order motivator in the buying decision. This is because agents are atomistic (i.e., individually, each is vanishingly small), so the probability of an agent being pivotal in the corporate vote is vanishing. Therefore, the ability to vote a share has vanishing value for our agents. As a consequence, the abstention issue looms large and will be addressed in Section 8.1. With this being said, when shareholders do vote their shares, the assumptions made in the following sections guarantee that they will behave as if they are pivotal and thus vote them sincerely – see Section 4.3 generally and, specifically, the "small randomness" discussion on page 21.[27]

Investors as citizens Missing from the agent's utility function (1) is a component that captures the cost and benefit that a type-t agent experiences *as a citizen* from the firm's revenue and ESG level. This component can be introduced by adding a function $H_t(e)$ that is independent of q, the agent's share ownership. But what should the function $H_t(e)$ look like? A possible specification is $H_t(e) = K_t \cdot [\mu(e) + h_t(e)]$, with K_t a positive constant capturing the degree to which societal consequences are internalized by the agent. This specification implies that agents *as citizens* trade off the social costs and benefits of ESG *at the same rate each type trades them off as investors*. Put differently, in this scenario, investors may be selfish (if their K_t is low), but they are not hypocritical: they make the same tradeoff between the costs and benefits of ESG as they would as citizens. In this scenario, the presence of $H_t(e)$ will affect the agents' welfare but not their ideal ESG levels and choice of q, so the analysis applies verbatim. If, instead, $H_t(e)$ is specified differently, then both types' ideal ESG level (i.e., the solution to problem 2) will become dependent on q – the intuition being that an agent who owns more shares will think more like an investor and less as a citizen. In this specification, the analysis would be more cumbersome, but the forces highlighted in this paper will continue to operate.

[27] We regard sincere voting as uncontroversial because it is standard in the great majority of the voting literature.

4 Different mechanisms for setting the firm's ESG level

This section compares different mechanisms through which the individual investors' preferences translate into corporate ESG policies. Subsections 4.2 and 4.3 are key: later, we will see that subsection 4.2 characterizes the equilibrium ESG level when pass-through voting is not allowed (Section 6), and subsection 4.3 the outcome when pass-through voting is allowed (Section 7).

4.1 ESG level is set by the median voter in the population (one-head-one-vote)

In this section we study the scenario in which citizens get to decide on the ESG level e by simple majority voting. Implicitly, we have in mind a scenario in which citizen/agents are a large but finite number, as opposed to a continuum.[28] To fix ideas, we assume that all citizens vote.

To circumvent details concerning agenda setting, i.e., who has the power to put proposals to a vote, we adopt a stylized voting protocol where every citizen ι reports a value e_ι, and the median value among all reports is implemented. With this protocol, it is a dominant strategy for each citizen to report her ideal ESG level $\widehat{e}_t$. This leads to implementing the median voter's ideal policy.[29] Therefore, the following proposition is immediate.

Proposition 1 (**ESG level is set politically**)**.** Suppose the ESG level is set by the median voter. If $m_A < m_B$, then $\widehat{e}_B$ will be implemented. If $m_A > m_B$, then $\widehat{e}_A$ will be implemented.

Recall that $\widehat{e}_t$, defined in (2), is type t's ideal policy. This proposition says that type A's will get their ideal policy if and only if they are a majority of the population.

4.2 ESG level is set to maximize stock value

In this section we study the scenario in which e is chosen to maximize the value of the corporation's stock, i.e., the value of p^*. This problem boils down to

[28] For more details, refer to the "small randomness" discussion at page 21.

[29] The same outcome would be reached if, for example, two parties $p = 1, 2$ competed for votes by selecting a platform e_p. In this case, the median voter theorem applies, with the median corresponding to either $\widehat{e}_A$ or $\widehat{e}_B$.

choosing the $\widetilde{e}$ that, for any given price p, maximizes the aggregate demand for shares. Formally:

$$\begin{aligned}\widetilde{e} &= \arg\max_{e} Q^A(p;e) + Q^B(p;e) \\ &= \arg\max_{e} \frac{m_A}{r_A}\left[\mu(e) + h_A(e) - p\right] + \frac{m_B}{r_B}\left[\mu(e) + h_B(e) - p\right]. \end{aligned} \tag{6}$$

Note that the functional forms that replace Q^A and Q^B in expression (6) omit the max operator featured in equation (3): this omission is legitimate in light of the discussion following condition (5) at page 16.

Problem (6) is a convex combination of problem (2) for types A and B, with weights $\frac{m_A}{r_A}$ and $\frac{m_B}{r_B}$. Therefore, intuitively, the solution to problem (6) is a convex combination of $\widehat{e}_A$ and $\widehat{e}_B$.

Proposition 2 (**ESG level is set to maximize stock value**)**.** The ESG level $\widetilde{e}$ that maximizes stock value is strictly greater than $\widehat{e}_B$, strictly smaller than $\widehat{e}_A$, and strictly decreasing in $\frac{m_B}{r_B}$ for $\frac{m_B}{r_B} \in (0, \infty)$. Moreover, $\widetilde{e}$ converges to $\widehat{e}_B$ (resp., $\widehat{e}_A$) when $\frac{m_B}{r_B}$ approaches ∞ (resp., zero).

Proof. See Appendix A. □

Intuitively, this proposition says that maximizing stock value requires pleasing two different constituencies, A and B, and the more numerous constituency t is, in relative terms, the closer the stock-value maximizing ESG level is to that constituency's ideal ESG level $\widehat{e}_t$. When compared with Proposition 1, we see that the ESG level that maximizes stock value is more moderate than the one chosen by the median voter. We will return to this observation later.

The ESG level that maximizes stock value does not maximize investor welfare. The ESG level that maximizes investor welfare solves:

$$\max_{e} m_A u_A\left(p^*, q^A; e\right) + m_B u_B\left(p^*, q^B; e\right), \tag{7}$$

where p^* is the stock market equilibrium price given e (Definition 1) and q^t is type t's demand given by (3). From a technical perspective, problem (7) is obviously not the same as problem (6), showing that investor welfare maximization does not coincide with stock value maximization. As a welfare measure, one can view problem (7) as "undercounting" the benefits of ESG because it restrict attention to the impact of ESG on shareholders, ignoring its impact on citizens at large. The following proposition gives further insight on the investor-welfare

maximizing ESG level.

Proposition 3 (**the ESG level that maximizes stock value does not maximize investor welfare**)**.** Slightly increasing e above the level $\widetilde{e}$ that maximizes the stock value increases investor welfare.

Proof. See Appendix A. □

Proposition 3 suggests, but does not formally establish, that the ESG level that maximizes investor welfare is above the level that maximizes stock value. This is because Proposition 3 is a local statement: we are not guaranteed that problem (7) is globally concave. Further analysis is therefore required to establish the properties of the global solution to problem (7).

4.3 ESG level is set by direct one-share-one-vote

In this section we study the scenario in which the ESG level is set by one-share-one-vote and all shareholders vote directly rather than through an investment fund. To fix ideas, we assume that all shareholders participate in the vote: abstention is discussed in Section 7.

To circumvent details concerning agenda setting, we adopt a stylized voting protocol where every shareholder ι reports a value e_ι, and the share-weighted median value among all reports is implemented. This protocol is intended to approximate a scenario in which the total amount of shares, albeit large, is finite, and so is the number of investors. In this scenario, allowing for some small randomness in each investor's vote, there exists a (vanishingly small) probability that the vote is so close that the individual investor's vote makes a difference. Then, it is a dominant strategy for every citizen to report her ideal ESG level $\widehat{e}_t$. If investors follow their dominant strategy, the implemented policy is the ideal policy of the share-weighted median shareholder.[30]

Next, we define an equilibrium when corporate ESG is set by one-share-one-vote.

Definition 2 (**one-share-one-vote equilibrium**)**.** A one-share-one-vote equilibrium is a vector (p^*, e^*) such that:

1. (one-share-one-vote) If $Q^A(p^*; e^*) \geq Q^B(p^*; e^*)$ then $e^* = \widehat{e}_A$, else $e^* = \widehat{e}_B$

[30] The same outcome would be reached if, for example, two "parties" $p = 1, 2$ competed for votes by selecting a platform e_p. In this case, the median voter theorem applies.

2. (sincere voting) $\widehat{e}_A, \widehat{e}_B$ are defined by eq. (2)

3. (market clearing) condition (5) holds with $p = p^*$.

Part 1 in the above definition captures the fact that shareholders correctly forecast the equilibrium level of e when buying their shares, and the fact that e is determined according to one-share-one-vote. This part has a fixed-point flavor, reflecting the fact that the ESG level is chosen based on how many shares the two types buy, and agents choose how many shares to buy based partly on their expectation about this ESG level. Part 2 captures sincere voting. Part 3 pins down the equilibrium price of a share.

Proposition 4 (**ESG level is determined as part of a one-share-one-vote equilibrium**)**.** There is a one-share-one-vote equilibrium with $e^* = 0$ if and only if $\frac{m_B}{r_B} \in (\underline{K}, \infty)$. There is a one-share-one-vote equilibrium with $e^* = \widehat{e}_A$ if and only if $\frac{m_B}{r_B} \in (0, \overline{K})$. Moreover, $\underline{K} = \frac{m_A}{r_A} < \overline{K}$, meaning that multiple equilibria exist if $\frac{m_B}{r_B}$ lies in the interval $(\underline{K}, \overline{K})$.

Proof. See Appendix A. □

Proposition 4 shows that, if there are few type B's, then the only one-share-one-vote equilibrium features type-A's ideal ESG level. If there are very many type B's, then there is only a single one-share-one-vote equilibrium that features type-B's ideal ESG level. But, there is an intermediate range of type B's where two equilibria coexist: in one equilibrium, every investor expects the firm to implement type A's ideal ESG level, which makes type A's more inclined to purchase shares compared to type B's, and the equilibrium price is such that type A's buy the majority of the shares, thus enabling them to implement their ideal ESG level. In another equilibrium, every investor expects the firm to implement type B's ideal ESG level, which makes shares relatively unattractive for type A's, and the equilibrium price is such that type B's buy the majority of the shares, thus enabling them to implement their ideal ESG level. The coexistence of these two equilibria reflects the self-confirming nature of one-share-one-vote equilibria when ownership is endogenous.

4.4 Summary of results so far, and interpretation

Summary of results so far Figure 6 summarizes the results we have obtained so far concerning the firm's ESG level. The figure portrays the case in

which $r_A < r_B$. The horizontal axis, $\frac{m_B}{r_B}$, represents type B's aggregate purchasing power, which depends positively on their numbers and negatively on their risk aversion.

When the ESG level is determined by the median voter in the population (orange line), the equilibrium ESG level equals $\widehat{e}_B$ or $\widehat{e}_A$ depending on whether m_B is below or above m_A (Proposition 1). When the ESG level is set to maximize stock value (black line), this ESG level $\widetilde{e}$ shrinks from $\widehat{e}_A$ toward $\widehat{e}_B$ as $\frac{m_B}{r_B}$ increases (Proposition 2). When the shareholders choose the ESG level as part of a one-share-one-vote equilibrium (blue line), the ESG level equals $\widehat{e}_B$ when $\frac{m_B}{r_B}$ is high and $\widehat{e}_A$ when $\frac{m_B}{r_B}$ is low; moreover, for intermediate values of $\frac{m_B}{r_B}$ both ESG levels are part of the equilibrium (multiple equilibria) – see Proposition 4.

Figure 6 shows that the equilibrium under the median voter (orange line) switches from high- to no-ESG precisely when the type-B agents become more numerous than the type-A's. In contrast, under one-share-one-vote the high-ESG equilibrium is more persistent (visually: the top blue line extends further than the top orange line). The reason is that the figure portrays the case $r_A < r_B$, in which a type-A agent is more inclined than a type B to buy shares, ceteris paribus. Since type A's are relatively more inclined to buy shares, under one-share-one-vote, their representation will be more substantial relative to type B's, and they will get their ideal ESG level more often. Note that there is a region to the right of $\frac{m_A}{r_A}$ where two blue lines overlap: this is the region where the two types' purchasing power is roughly the same in the aggregate, and so there are multiple equilibria under one-share-one-vote.

Finally, Figure 6 shows that, at any level $\frac{m_B}{r_B}$, the black line lies in between the ideal ESG levels of types A and B. We interpret this observation as saying that the ESG level that maximizes the stock's value is moderate relative to the two types' ideal ESG levels. This is intuitive because maximizing the value of the stock requires selecting a ESG level that can appeal to both types (cf. problem 6).

Interpretation: multiple equilibria Under the one-share-one-vote mechanism, the equilibrium ESG level is arrived at without any role being played by the firm's management. When there are multiple equilibria, however, one can imagine an informal role for management as "equilibrium selector." We do not delve here into a theory where management selects one of the two equilibria, but we note that the role of equilibrium selector need not necessarily be reserved for

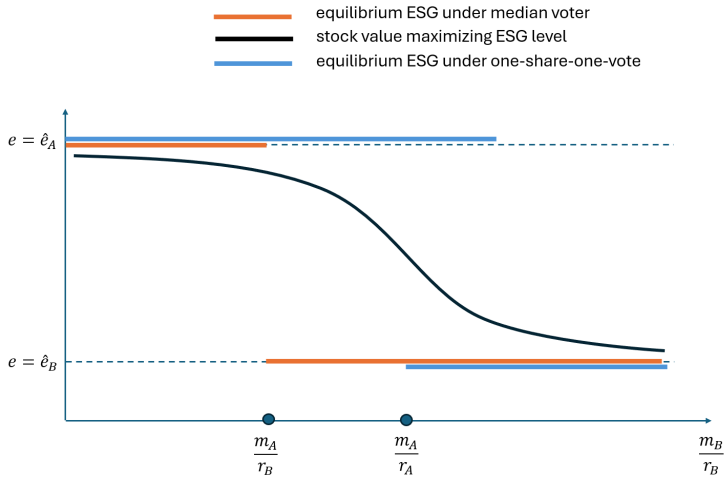


Figure 6: Equilibrium ESG level under different mechanisms for determining the firm's ESG level. This figure depicts the case in which $r_A < r_B$. The figure illustrates the comparative statics as $\frac{m_B}{r_B}$ changes.

management only: "political entrepreneurs," too, could play that role. Refer to Section 8.2 for a discussion of the role of political entrepreneurs.

Interpretation: exit, voice, and polarization In an influential book, Hirschman (1970) presents two channels through which an organization gets feedback about its performance: "exit," which involves the organization's members leaving the organization; and "voice," which involves them expressing discontent and attempting to bring about change.[31] These two options, separately or together, foster accountability and improvement in organizations. It is instructive to look at our analysis from the perspective of exit and voice, and how these two feedback channels affect the polarization of corporate decisions.

In our model, **exit** is represented by selling the company's shares and **voice** by the shareholder vote. The ESG level that maximizes stock value, i.e., the number of agents who want to become shareholders (refer back to Section 4.2), is also the level that minimizes shareholder **exit**. A company that sets ESG to maximize stock value will adopt a moderate ESG level, and that level is, of course, unique: there is no question of multiple equilibria (Theorem 1). This ESG level will turn out to be the one preferred by large funds (see Section

[31] A third concept, "loyalty," is a moderator that can influence whether individuals choose to exit or voice their concerns.

6). Under one-share-one-vote, both **exit** (how many agents of each type become shareholders) and **voice** (the way shareholders vote) are operative and contribute to determining ESG levels. This results in polarized outcomes and, potentially, multiple equilibria (see Section 4.3). These outcomes will arise in equilibrium under pass-through voting (see Section 7).

It is obvious that **voice alone** (i.e., voting) produces polarized outcomes in an environment where investors are polarized themselves. It is more interesting that **exit alone** would produce a moderate outcome despite investors being polarized. The reason is that, at any ESG level, marginal investors *of both types* are indifferent between buying shares or not. This fact, which is a consequence of transferable utility (the price mechanism) and decreasing marginal utility of shares, implies that the stock-value-maximizing ESG level must please investors of both types. The most novel observation, arguably, is that **exit and voice together** (pass-through voting) result in polarized ESG levels and, potentially, multiple equilibria. The multiplicity of equilibria can arise only when exit and voice are combined.

5 Many firms, and type-specific investment portfolios

So far, we have assumed that there is only one firm in the model. The extension to N potentially heterogeneous firms, each with its own expected profit $\mu_i(e_i)$ when the firm implements ESG level e_i, variance σ_i, and moral benefit $h_{i,t}(e_i)$ of owning firm i's shares, is immediate provided the firms' profits are independent random variables. We make this assumption. Then, there is no correlation between the return of any two firms in the model, and the utility function of a type-t investor who buys q_i shares of each firm at a price p_i has the following form:

$$\sum_{i=1}^{N} q_i \cdot \mu_i(e_i) - r_t \left(q \cdot \sigma_i\right)^2 - p_i \cdot q_i + q_i \cdot h_{i,t}(e_i). \tag{8}$$

The key property of expression (8) is that it is separably additive across firms, so the agent can solve the problem of how many shares q_i to acquire of each firm separately – that is, firm by firm. Therefore, all the results we obtained in the single-firm model extend verbatim to each firm i in the N-firm model. We denote by $\widehat{e}_{i,t}$ and $\widetilde{e}_i$ the solutions to problems (2) and (6) for each firm i.

Let $q_i^t(p_i; e_i)$ denote a type-t agent's demand for firm i's stock (refer to expression 3), so a type-t agent's portfolio is the vector $[q_i^t(p_i; e_i)]_{i=1}^N$. In equilibrium, type A's portfolio weights will generally be different from type B's because, for any two firms i and j, prices p_i, p_j (including equilibrium prices p_i^*, p_j^*), and ESG levels e_i, e_j, the ratio

$$\frac{q_i^t(p_i; e_i)}{q_j^t(p_j; e_j)} \tag{9}$$

will generally not be the same for $t = A$ and B (cf. expression 3). In other words, types A and B will have different equilibrium portfolio weights whenever they value the firm's ESG stance differently.

The next result shows that, intuitively, type A's equilibrium portfolio has relatively more shares of firm i if this firm does more ESG – and consequently, type B's equilibrium portfolio has relatively fewer.

Proposition 5 (**portfolio weights by ESG level**)**.** For any firm i, pick any two ESG levels $e_i' > e_i$ in the interval $(\widehat{e}_B, \widehat{e}_A)$. Then in a stock market equilibrium type A's individual and aggregate holdings of firm i's stock are greater (and, consequently, type B's are smaller) under e_i' than under e_i.

Proof. See Appendix A. □

This proposition says that if a firm's ESG level is increased exogenously, its stock becomes more likely to be held by type A's, and type A's portfolio will feature more of the firm's stock. Although this result is derived only for ESG levels in the interval $(\widehat{e}_B, \widehat{e}_A)$, this restriction is inconsequential because, in our model, no agent would ever set an ESG level outside of this interval.

6 Introducing investment funds without pass-through voting

In the pass-through-voting setting analyzed in Section 4.3, individual investors purchase and vote their shares directly without intermediaries. In reality, many individual investors hold their shares through investment funds, and these funds vote their investors' shares. Here, we study how the analysis changes in the presence of investment funds. For simplicity, in this section, we assume that agents can only buy shares through an investment fund and that the shares are

voted by the fund and not by the individual investor (i.e., not by the fundholder). Also, we maintain the assumption that the implemented policy is the share-weighted median report among the voters (which, in this case, are funds and not individual shareholders): this assumption guarantees sincere voting on the funds' part.

First, let us define what is an investment fund in our model. A fund bundles shares of firm $i = 1, \ldots, N$ in a proportion to be specified below, charges customers the market price of the bundle plus a markup fee f per dollar of assets under management, and incurs a marginal cost for every dollar of assets under management (and thus held on a customer's account). Funds "vote their shares," meaning that, in each firm i, a fund will influence the choice of e_i in proportion to its ownership of firm i by casting votes in a one-share-one-vote contest. All funds maximize the revenue from their fees.

We study two types of funds. *Small funds*, who compete for customers by offering them a desirable bundle, by lowering their fees, and by committing to vote their shares in a certain way. The small funds' marginal cost of holding shares is denoted by $c \geq 0$, which we assume is low enough that some customers purchase from the small funds in equilibrium. There is free entry of small funds. In addition, there is a fixed number of *large funds* who only serve captive customers (e.g., 401k savings) and, we assume, sell them the market portfolio. A large fund's customers can only buy from that one fund, but they can buy any amount of fund shares (perhaps in addition to a statutory minimum, which we take to be low enough not to be binding). For large funds, the cost of holding shares is normalized to zero. Overall, a fraction λ of agents randomly drawn from the population are captive of some large fund.

A few comments on the way funds are modeled. The way small funds are modeled implies that free entry drives them to compete with each other ruthlessly for customers (extensive margin) by offering type A's or B's preferred portfolios and lowering their fees down to c. Intuitively, this will lead small funds to vote for polarized ESG stances. Large funds, in contrast, are protected from competition from other funds and can only win more business from their allotted customers (intensive margin). For large funds, the ESG level that maximizes fees is the one that maximizes individual investors' demand for shares, because a higher demand translates into higher stock prices and, thus, greater value of assets under management for the fund. The assumption that large funds do not compete on an extensive margin is admittedly stark and only partially correct. In reality, large fund families do compete for customers, but, because

they have more "sticky" customers and because they represent a larger fraction of the market, their incentives are more aligned with maximizing the average investor's demand for shares, compared with the small funds' incentives.[32] Finally, we ignore the political and brand pressures that also, in our view, push the ESG stance of large investment funds toward the middle of the range of societally acceptable ESG levels. These omitted forces reinforce our result that large funds skew toward the middle of ESG ideal points.

Behavior of small and competitive funds Because of free entry, small funds' equilibrium fees will equal their marginal cost c. We have seen in Section 5 that, given a vector of equilibrium prices and firm ESG levels $[p_i^*, e_i^*]_{i=1}^N$, investors of different types will want to purchase different portfolios: type-A investors will wish to purchase portfolio $[q_i^A\left(p_i^*(1+c); e_i^*\right)]_{i=1}^N$ and type-B investors will wish to purchase $[q_i^B\left(p_i^*(1+c); e_i^*\right)]_{i=1}^N$. So, in any equilibrium, the small investment funds will offer these two different (and extremal) portfolios. Without loss of generality, then, we can think of each small fund as concentrating on a particular investor type so that there are type-A and type-B funds. How should these funds commit to voting their shares? To make its portfolio most attractive to type-t customers, intuitively, a type-t fund will commit to voting type-t's ideal ESG level $\widehat{e}_{i,t}$ which, for each firm i, maximizes (2).[33]

Behavior of large funds with captive customers Large funds offer a portfolio that weighs companies according to market value. In our context, this amounts to offering a portfolio $[\overline{q}_i]_{i=1}^N = \alpha \times [Q_i^T]_{i=1}^N$, where $\alpha < 1$ is a scaling factor.[34] This is not any investor's ideal portfolio, but large funds do not compete for customers, so they are able to earn some profit by raising their fee above their marginal cost, which is normalized to zero. Each fund determines the profit-maximizing fee level by trading off the increased revenue

[32] To understand why being large aligns incentives with demand maximization, consider the polar case of monopoly: a single large fund with 100% of the market. For such a fund, the ESG level that maximizes the value of AUM is also the one that maximizes demand for shares.

[33] The reason why small funds vote their customer's ideal point, while intuitive, requires some explanation. In our setting, investors only care about the level of ESG implemented by the firm, not directly about how "their" shares are voted: refer back to the "second-order" discussion at page 18 and to the "small randomness" discussion at page 21. Still, it is optimal for a small type-t funds to vote $\widehat{e}_{i,t}$ because, in the event that the fund is pivotal, the fund's vote is determinant in supporting the ESG level that maximizes type t's demand for the particular portfolio offered by a type-t fund. This argument would be even stronger if investors also had a deontological preference for how their shares are voted – refer to the discussion at page 17.

[34] This is the market portfolio because the relative value of each firm's share in it corresponds to that firm's capitalization as the fraction of the total market.

from increasing the fee with the reduction in their customers' demand for the funds' shares. As regards the firms' ESG levels, a large fund prefers the level that maximizes its customers' demand for the market portfolio, thus allowing the fund to charge the highest possible fees. For each firm i, this is the ESG level $\widetilde{e}_i$ that solves problem (6).

Equilibrium with investment funds In equilibrium, large funds make positive profits, and small funds make zero profits. Agents captive of large funds buy less than if they would buy through small funds (double marginalization). How many shares are held by the large-fund sector depends on the large funds' chosen fee level: the higher the fee, the lower this share. Whatever shares are not held by the large funds will be held by the small competitive funds, who charge a fee equal to c. In each firm i, large funds will vote their shares $\widetilde{e}_i$, small type-A funds will vote their shares $\widehat{e}_{i,A}$, and small type-B will vote them $e_i = 0$.

Proposition 6 (**ESG level in the one-share-one-vote equilibrium with investment funds**)**.** In a one-share-one-vote setting with investment funds, fix the fraction $\lambda \in (0,1)$ of agents who are captive customers of some large fund.

1. If $\frac{m_B}{r_B}$ is sufficiently close to zero, the equilibrium ESG level becomes arbitrarily close to $\widehat{e}_{i,A}$ in every firm i.
2. If $\frac{m_B}{r_B}$ is large enough, the equilibrium ESG level in every firm i approaches $\widehat{e}_{i,B}$.
3. For every firm i, there is a value of $\frac{m_B}{r_B}$ such that the equilibrium ESG level in firm i maximizes firm i's stock value.

Proof. See Appendix A. □

Parts 1 and 2 are intuitive. As the whole economy becomes overwhelmingly made up of type-t investors, the voice of investors of the opposite type becomes irrelevant within small funds, and their aggregate purchasing power becomes irrelevant in problem (6), which determines the vote of large funds. So, unsurprisingly, the whole economy follows type-t's ideal ESG level.

Part 3 is instructive: it says that, under certain conditions, large funds are able to impose their preferred (and comparatively moderate) ESG level. This statement is somewhat surprising because it holds even when λ is very small, i.e., even when large funds have a very small number of customers. The

explanation is that the statement of part 3 only applies to very specific values of $\frac{m_B}{r_B}$, namely, those at which that aggregate demand of non-captive type A's just about counterbalances that of non-captive type B's, thus making large funds the median voter even if they hold few shares. Another notable limitation of the statement in part 3 is that the values of $\frac{m_B}{r_B}$ that work are specific to each firm i meaning, in particular, that the statement does not imply that the large funds' moderating influence should be expected to apply across all firms.

We now turn to our main focus, the case where λ is very large, meaning that most agents are captive of large funds. In this case, it's obvious that large funds will dominate corporate voting and will be able to impose their preferred ESG level $\widetilde{e}_i$. We record this observation in a theorem.

Theorem 1 (**moderating influence of large funds**)**.** If λ is sufficiently close to 1, the equilibrium ESG level in a one-share-one-vote equilibrium with investment funds is $\widetilde{e}_i$ for all i.

This theorem is our first main result. The significance of Theorem 1 is that when large funds dominate the investment world, they will be able to exert their moderating influence *across all firms* by imposing $\widetilde{e}_i$ for all i. This is in contrast with the scenario in Proposition 6 part 3, in which the large funds may not hold many agents captive: as a result, the moderating influence in Proposition 6 part 3 only holds for specific values of $\frac{m_B}{r_B}$ and, moreover, needs not apply across all firms. Theorem 1 says that if large funds are dominant, then in each firm, they will be able to impose the moderate stock-value maximizing ESG level characterized in Section 4.2.

We conclude this section with an observation about fees. In equilibrium, small funds charge $f = c$ and large funds set the monopoly fee that maximizes profits. The level of this profit-maximizing fee depends on the customers' demand elasticity and it may be higher or lower than c. In particular, it is possible in equilibrium that large funds charge a smaller fee than small funds, which is realistic. But the difference in fees cannot be too large, lest small-fund customers choose to buy their shares from the large funds at a much lower fee, even though the market portfolio sold by large funds is neither type's ideal portfolio.

7 Investment funds with pass-through voting

In this section, we extend the model in Section 6 to allow for pass-through voting. We still assume that all shares are held through funds but, unlike in Section

6, the funds don't necessarily vote all the shares they own. Instead, a fraction $\pi \in [0,1]$ of the individual investors (i.e., the fundholders) vote their shares according to their own ideal point. The shares of the rest of the individual investors are voted by the fund. For simplicity of exposition, in this section we restrict attention to the case of a single firm – hence i subscripts will not appear. Formally, then, in this setting, for a given π, a fraction $(1-\pi)\lambda$ of agents delegates their votes to a large fund; of the remaining agents, a fraction $\frac{m_A}{m_A+m_B}$ is type A and is able to vote $\widehat{e}_A$, and a complementary fraction is type B and is able to vote $\widehat{e}_B$. The previous Section 6 is the special case where $\pi = 0$. The parameter π captures the degree to which captive investors are able to "vote their shares" and, therefore, the prevalence of pass-through voting.

In this setting, pass-through voting makes no difference for investors who invest through the small funds, because these funds cater perfectly to their individual investors' voting preferences. However, pass-through voting does benefit captive investors because, in the rare pivotal event, their shares would otherwise be voted $\widetilde{e}$, a moderate stance that is not in line with the individual investor's own preferences.

How does the equilibrium level of ESG provision vary with the parameter π? Fix m_A, m_B, and set λ sufficiently close to 1 that, if $\pi = 0$, the equilibrium of Theorem 1 is implemented. In this scenario, the large-fund sector is large enough that it can implement its preferred moderate ESG stance. This scenario captures the present state of affairs with $\pi = 0$ (no pass-through voting).

Now, progressively raise π above zero. For any $\pi > 0$, a fraction $(1-\pi)\lambda$ of agents remains captive of the large funds. The remaining agents are free to vote their ideal ESG level: a fraction is type A and will vote $\widehat{e}_A$, and a complementary fraction is type B and will vote $\widehat{e}_B$. For π close enough to zero, the equilibrium ESG level and fund fees are the same as in Theorem 1. However, as π increases, so do the votes for non-moderate ESG stances. For the equilibrium of Theorem 1 to survive, it must be, for all t:

$$(1-\lambda)\, m_t \cdot q_t(\overline{p}+c, \widetilde{e}) + \lambda\, \pi\, m_t \cdot q_t(\overline{p}+\overline{f}, \widetilde{e}) \leq \frac{Q^T}{2}, \tag{10}$$

where $\overline{p}$ and $\overline{f}$ represent the equilibrium share price and large-fund fee in the equilibrium of Theorem 1. The first addend on the left-hand side of (10) is the number of shares held through small type-t funds. The second addend is the number of shares held by type-t agents through large funds which are voted via pass-through voting. Their sum, i.e., the right-hand side of (10), represents

how many shares are voted for type t's ideal ESG level. If the inequality in (10) is violated for some t, then it must be that at least one of the two extreme platforms, either $e = \widehat{e}_A$ or $e = \widehat{e}_B$, is voted by more than 50% of the shares, which means that $\widetilde{e}$ cannot be the share-weighted median, so the equilibrium of Theorem 1 breaks down.

Let $\overline{\pi} < 1$ denote the threshold above which the inequality in (10) fails.[35] For values of π slightly above $\overline{\pi}$, an equilibrium with ESG level $\widetilde{e}$ may exist. In such an equilibrium, the large-fund sector would choose to reduce their fee below $\overline{f}$ in order to attract more customers and, in this way, keep the share-weighted median vote at $\widetilde{e}$. Whether large-fund fees below $\overline{f}$ can be part of an equilibrium depends on the structural details of the large-fund sector: how many large funds there are, how many agents are captive, etc. Regardless, as π approaches 1, the attempt to keep the share-weighted median vote at $\widetilde{e}$ is futile because large funds have a vanishing amount of shares that they can vote. Therefore, for π sufficiently close to 1, the equilibrium (or equilibria) ESG levels are either $\widehat{e}_A$ or $\widehat{e}_B$.

Theorem 2 (**polarizing influence of pass-through voting**)**.** If π sufficiently close to 1, the equilibrium ESG levels are either $\widehat{e}_A$ or $\widehat{e}_B$.

This theorem is our second main result: it highlights the polarizing influence of pass-through voting. Theorem 2 says that if pass-through voting is universal ($\pi = 1$), then the ESG equilibrium set in each firm will coincide with the one characterized in Section 4.3, including multiple equilibria when warranted by firm-specific parameter configurations. Therefore, the outcome will be polarized in one direction or the other.

Theorem 2 is best appreciated in relationship with Theorem 1, which shows that absent pass-through voting (i.e., if $\pi = 0$), if large funds capture a large enough fraction of agents (i.e., for large enough λ), these funds will be able to impose a moderate ESG stance. But Theorem 2 shows that, even if large funds are dominant – i.e., even if λ is close enough to 1 that, when $\pi = 0$, the equilibrium ESG level is $\widetilde{e}$ – their moderating influence is negated if pass-through voting is sufficiently pervasive. This is not surprising because pass-through voting allows all voters, including those who are captive of large funds,

[35] We know that $\overline{\pi} < 1$ because, when $\pi = 1$, the right-hand side of (10) represents *all* shares held by type-t agents in equilibrium. Summing across types must yield Q^T by the equilibrium market clearing condition. Therefore, one type must hold strictly more than $Q^T/2$ shares (except for the knife-edge case where types A and B hold exactly the same shares in equilibrium). Since the weak inequality in (10) fails at $\pi = 1$, it must also fail at some $\pi = 1$, which shows that $\overline{\pi} < 1$.

to express their (immoderate) preferences.

We conclude with the observation that Theorem 2 is expected to generalize readily to the N-firms case. Indeed, we have already discussed how Proposition 4 generalizes verbatim to N firms: the equilibrium characterized in Theorem 2 is essentially identical, with the only difference that an endogenous fraction of shares is held by captive investors who, even though they vote them as they wish, pay more to hold them than non-captive investors.

8 Discussion and predictions

A commonly held view is that introducing pass-through voting will not make a meaningful difference because individual investors actually don't care much about ESG and corporate voting more generally. We acknowledge that most people don't even know the meaning of the term ESG[36] and, when given the opportunity – for example, under one of the pass-through initiatives described above – very few individual investors vote.[37] So, do individual investors actually care about corporate voting? And can a pass-through voting system make a difference? We think so. In this section, we articulate the reasons why.

8.1 Discussion: the present state of pass-through voting

Ongoing pass-through voting initiatives At the time of this writing, several major fund families have launched pass-through pilot initiatives. These initiatives vary in the amount of assets eligible for the program, but all of them limit an investor to picking one among a few discrete "investment policies" – essentially, generic value statements according to which the fund commits to vote their shares. In all cases we are aware of, the available options for investors are institutionally curated. Moreover, the set of options does not necessarily cover the spectrum of individual investors' ideal points: Montagnes et al. (2024) argues that the investing policies offered to investors fail to represent the ideal points of a large fraction of them. Finally, there is considerable ambiguity in what level of ESG each option would require.

To our knowledge, only Vanguard has released information about participation in pass-through initiatives. The participation rate in Vanguard's pilot was

[36] According to a recent survey, only 9% of registered voters can correctly define the term ESG.

[37] See footnote 9.

low, with approximately 2% of eligible shareholders participating.[38] Our main takeaway from the existing pass-through voting initiatives is that participation has been low so far.

The current implementation of pass-through voting does not encourage turnout We recognize that, on the whole, individual investors are currently disengaged from corporate voting – even under the pass-through initiatives implemented so far. But we think that investors are apathetic because, when asked to vote, their options are either non-existent (in most director elections, there is no alternative to the management slate) or unclear (in pass-through voting initiatives, where the available options for investors are vague). Most importantly, there are no public opinion campaigns around corporate voting – including pass-through voting. But when investors are offered meaningful alternatives, and there are public opinion campaigns, as was the case in the Disney proxy vote, turnout can be as high as 60%.[39]

To us, the evidence suggests that the current rules make corporate contests boring, even in pass-through voting initiatives. But a different set of rules could make corporate contests exciting and offer investors alternatives that they perceive as meaningful. We turn to these rules next.

8.2 Predictions: a future with open pass-through voting

How to encourage turnout in pass-through voting We propose the following definition.

Definition 3 (**open pass-through voting**)**.** Open pass-through voting is a voting system with the following features.

1. *Contestability:* it is easy to add options for investors to vote on
2. *Transparency:* the options can be presented in a way that is understandable to investors
3. *Fluidity:* investors can express their preferences quickly and easily.

Note that this definition does not specify the options investors can vote on. In the current pass-through voting initiatives, these options are investment policies. Alternatively, one could conceive of options as trusted human

[38] See Vanguard (2024).
[39] Refer to footnote 10.

representatives to which investors delegate their vote, as is commonly done in representative democracy.

Political voting under representative democracy happens to satisfy the three criteria in Definition 3 (provided, of course, "investors" are replaced with "citizens"). Contestability is achieved by allowing many parties on the ballot or, in a two-party system, by having primary elections. Transparency is achieved by allowing political advertising. And fluidity is achieved by representative democracy, i.e., by asking citizens to vote rarely for a single trusted representative rather than frequently on a myriad of diverse issues.

In our view, the existing pass-through voting initiatives fail to be contestable and transparent: refer back to the discussion at page 33. Next, we offer some thoughts on how to inject contestability and transparency into pass-through voting.

How to create open pass-through voting: human representatives rather than abstract investing policies In our view, a simple way to create an open pass-through voting system would be to allow investors to vote for (i.e., delegate their shares to) human representatives rather than for abstract investment policies. A representative who received enough voting proxies to meet a minimum threshold level (analogous to the 5% minimum vote share threshold that political parties must meet to gain representation in Germany's federal parliament) could exercise them in corporate contests until such time as the proxies are revoked.

If implemented, we predict that such a system would dramatically change incentives. We predict that selected individuals would emerge who would compete for the individual investors' proxies, much like political representatives compete for votes. We refer to these actors as *political entrepreneurs*.

Political entrepreneurs, we predict, would play the same role that representatives play in politics: to acquire the information and devote the time necessary to deliberate and vote in a way that represents those who selected them (individual investors, in our case). The competition among political entrepreneurs may feature sharp messaging that elevates the public profile of corporate contests, and some of the messaging may be polarizing. These political entrepreneurs will appeal to moral values in an effort to gain the individual investors' trust. Multiple political entrepreneurs, we predict, will arise advocating different corporate policies (in our model, ESG skeptic vs. activist policies), each styling themselves as "champions of the individual investors" in opposition to other

political entrepreneurs.

All this, we predict, will inject contestability and transparency into pass-through voting. It will, also, raise the public profiles of these political entrepreneurs.

Connection with our theoretical model of pass-through voting Consider the version of our model where all individual investors have access to pass-through voting, i.e., where $\pi = 1$. This model's equilibrium ESG level, firm by firm, is the same as in the direct one-share-one-vote model of Section 4.3. This model, in turn, is equivalent to a model with free entry of political entrepreneurs, each of whom maximizes the shares delegated to him/her by committing to an ESG stance.[40] Therefore, the model of Section 4.3 maps directly into a real-world scenario in which political entrepreneurs are allowed to receive and vote individual investor proxies. In other words, the theoretical properties of Section 4.3's model illustrate what would happen in a real-world scenario where political entrepreneurs are allowed.

Prediction: the nature of politics with open pass-through voting In our model (and, we believe, in reality also), it is much cheaper for retail investors to act on their ESG preferences through voice, i.e., by shifting one's votes than through exit, i.e., by selling one's shares.[41] So, when shareholder voice matters (pass-through voting), we predict lots of persuasion efforts targeted at shareholders about who they should delegate their shares to, but few attempts to start share boycotts (divestment campaigns) or "buycotts" (the opposite of a boycott). Furthermore, under an open pass-through system in the sense of Definition 3, we predict that large funds will come out openly in support of their preferred (moderate, in our model) ESG levels against more-extreme alternatives proposed by political entrepreneurs.

The unintended consequence of open pass-through: polarization In this section, we have argued that investors are inherently polarized on ESG

[40] Although the voting protocol in Section 4.3 does not feature political entrepreneurs, we already noted in footnote 30 that the protocol is outcome-equivalent to the one in which two "parties" $p = 1, 2$ competed for proxies. The same is true with free entry of political entrepreneurs: if there are many political entrepreneurs indexed by p, each seeking to maximize the shares delegated to him/her by committing to a platform e_p of their choice, all political entrepreneurs will choose either $e_p = \widehat{e}_A$ or $e_p = \widehat{e}_B$.

[41] This point was made formally in the "second-order" discussion at page 18 and in the "small randomness discussion at page 21.

matters and that this polarization will emerge if and when open pass-through voting is implemented. This perspective highlights an unpleasant dilemma: in a polarized world, true democracy may be incompatible with moderation.

This unpleasant dilemma may be resolved by using alternative methods of democratic aggregation. For example, Zingales et al. (2024) propose the *citizen assembly* method of preference aggregation which, in our view, has the potential to mitigate investor polarization. If practically implementable, citizen assemblies can be an interesting alternative to pass-through voting.

9 Conclusions

This paper contributes to understanding how political polarization affects corporate governance and decision-making, particularly in the ESG context. We introduce a theoretical framework where investors are polarized: some prefer a high level of ESG (activists), others prefer very little ESG (skeptics), but very few investors (in our model, none) are moderate. Within this framework, we investigate whether corporate policies are polarized in equilibrium.

In the present system where individual investors cannot vote shares held through a fund, large investment funds have the most influence concerning ESG. We find that large investment funds will seek to attract investors of both types, skeptics and activists, in order to maximize fees. This fee-maximizing ESG level, we show, is moderate: it is a convex combination of the ideal points of skeptics and activist investors. In any given firm, this ESG level will be higher (more ESG) if investors of either type value ESG in that particular firm more highly, relative to profits. Across the whole portfolio of firms, this fee-maximizing ESG level is larger if there are more activist types among the individual investors. For small funds, the fee-maximizing ESG level is different and coincides with the ideal points of either investor type. Thus, our theory explains the current state of affairs which, we perceive, is one where investors are polarized on ESG but large funds impose moderate ESG policies on their portfolio firms, while small funds push for more extreme stances in either direction in order to maximize customer demand.

Our model allows us to address the following counterfactual question. Would firms take different stances on ESG if they responded to their shareholders' votes (pass-through voting) rather than to the large investment funds who currently vote their individual investors' shares? In our framework, the answer is yes. Un-

der pass-through voting, the moderating influence of large funds is replaced by a voting contest among investors with polarized preferences, leading to extreme corporate policies (either very high or very low ESG). The paper envisages, in a future pass-through voting system where individual investors can delegate their corporate votes to trusted representatives of their choice, that "political entrepreneurs" would arise who champion these extreme policies. Such a pass-through system, we predict, would facilitate greater engagement among individual investors but, at the same time, lead to a more politicized ESG debate.

The analysis of pass-through voting also reveals the possibility of multiple self-confirming equilibria where only extreme ESG policies are implemented. We interpret this multiplicity as instability, potentially creating incentives for management and political entrepreneurs to manipulate the governance process.

We structure these findings through Hirschman (1970)'s "exit and voice" framework. In our model, large mutual funds set their ESG level to minimize exit (because they maximize investor participation in the stock market) whereas, under pass-through voting, the ESG level is also determined by voice. When individual investors are polarized, exit and voice lead to quite different strategic choices, as we have shown; therefore, exit is not a perfect substitute for voice. In this sense, this paper is about exit, voice, and polarization in corporate governance.

Finally, we acknowledge that the determination of corporate ESG takes place in the shadow of legislation: in fact, much of the issues that are subsumed by ESG can be regulated through the legislative channel. In our model, the legislature would implement the ESG level preferred by the majority of the population – including those don't invest in the stock market and who, likely, have different views on certain ESG issues.

These findings contribute to the existing literature on corporate governance and shareholder activism, providing a nuanced perspective on the interplay between investor ideology, governance mechanisms, and corporate strategy. From a societal perspective, our findings raise important questions about the governance of corporations and the role of individual investors. As the results suggest that pass-through voting could lead to extreme ESG policies, they also imply a need for regulatory frameworks that ensure diverse investor voices are represented without allowing significant polarization to skew corporate decisions. For finance practitioners, the potential shift towards more-extreme ESG policies under pass-through voting scenarios suggests that practitioners should be pre-

pared for changing investor sentiment and the evolving landscape of shareholder engagement.

Appendix A: Proofs

Proof of Proposition 2

Proof. Because the functions $\mu(\cdot)$ and $h_t(\cdot)$ are differentiable and $\mu(\cdot)$ is strictly decreasing, the value of e that solves expression (6) is strictly decreasing in the quantity $\frac{m_B}{r_B}$. Because m_A and m_B are strictly positive, it follows that the solution to problem (6) cannot equal either $\widehat{e}_B$ or $\widehat{e}_A$ (which, recall, are the solution to problem (6) when m_A or m_B equal zero). Finally, when $\frac{m_B}{r_B}$ approaches ∞ (resp., zero) $\widetilde{e}$ converges to $\widehat{e}_B$ (resp., $\widehat{e}_A$) because problem (6) converges to problem (2) with index $t = B$ (resp., A). □

Proof of Proposition 3

Proof. Differentiate with respect to e and make use of the envelope theorem on q^t to get the following first order conditions:

$$m_A \left[\frac{du_A}{dp^*} \frac{dp^*}{de} + \frac{du_A}{de} \right] + m_B \left[\frac{du_B}{dp^*} \frac{dp^*}{de} + \frac{du_B}{de} \right] = 0.$$

Recognizing that $du_t/dp = -q^t$ (refer to 1) and collecting terms, we get:

$$-\left[m_A q^A + m_B q^B \right] \frac{dp^*}{de} + \left[m_A \frac{du_A}{de} + m_B \frac{du_B}{de} \right] = 0. \tag{11}$$

Use (1) to rewrite (11) as follows:

$$-\left[m_A q^A + m_B q^B \right] \frac{dp^*}{de} + \left[m_A q^A \frac{d}{de}[\mu(e) + h_A(e)] + m_B q^B \frac{d}{de}[\mu(e) + h_B(e)] \right] = 0. \tag{12}$$

Now evaluate this expression at $e = \widetilde{e}$. The first addend drops out because, by definition, $\widetilde{e}$ maximizes p^*. Then, after some rewriting, (12) reads:

$$r_A q^A \left[\frac{d}{de} \frac{m_A}{r_A} [\mu(e) + h_A(e)] + \left(\frac{r_B q^B}{r_A q^A} \right) \cdot \frac{d}{de} \frac{m_B}{r_B} [\mu(e) + h_B(e)] \right]_{e=\widetilde{e}} = 0. \tag{13}$$

Note that, if $\frac{r_B q^B}{r_A q^A} = 1$, the term in brackets on the left-hand side would coincide with the first-order conditions of problem (6), which must vanish when evaluated

at $e = \widetilde{e}$. It turns out, however, that

$$\frac{r_B q^B}{r_A q^A} = \left.\frac{\mu(e) + h_B(e) - p^*}{\mu(e) + h_A(e) - p^*}\right|_{e=\widetilde{e}} < 1 \tag{14}$$

because, by Assumption 2, $h_A(e) > h_B(e)$ for all $e > \widehat{e}_B$. Moreover, because $\widetilde{e}$ lies between $\widehat{e}_B$ and $\widehat{e}_A$, the first derivative in brackets in (13) is strictly positive and the second is strictly negative. In light of (14), therefore, the left-hand side of (13) is greater than zero, showing that slightly increasing e above $e = \widetilde{e}$ increases investor welfare. □

Proof of Proposition 4

Proof. Given an equilibrium e^*, aggregate demand functions by type (see expression 4) are given by:

$$Q^A(p; e^*) = \frac{m_A}{2\sigma^2 r_A}\left[\mu(e^*) + h_A(e^*) - p\right] \tag{15}$$

$$Q^B(p; e^*) = \frac{m_B}{2\sigma^2 r_B}\left[\mu(e^*) + h_B(e^*) - p\right]. \tag{16}$$

Note that the functional forms that replace Q^A and Q^B in expression (6) omit the max operator featured in equation (3): this omission is legitimate in light of the discussion following condition (5) at page 16.

One-share-one-vote equilibrium set with $e^* = \widehat{e}_A$. Suppose a one-share-one-vote equilibrium price exists for a given constellation $(\frac{m_B}{r_B}, \frac{m_A}{r_A}, \widehat{e}_A)$. Now decrease the quantity $\frac{m_B}{r_B}$: total demand decreases, requiring a decrease in the price to recover market clearing. At the new market-clearing price, Q_A is larger (see expression 15), hence by market clearing Q_B (i.e., expression 16) must be smaller. Therefore, the ratio Q_A/Q_B is larger, proving that $\widehat{e}_A$ remains a one-share-one-vote equilibrium at the new lower lever of $\frac{m_B}{r_B}$. This shows that the set of values of $\frac{m_B}{r_B}$ for which $\widehat{e}_A$ is a one-share-one-vote equilibrium is an interval of the form $(0, \overline{K})$ for some $\overline{K}$.

One-share-one-vote equilibrium set with $e^* = \widehat{e}_B$. Suppose a one-share-one-vote equilibrium price exists for a given constellation $(\frac{m_B}{r_B}, \frac{m_A}{r_A}, \widehat{e}_B)$. Increase the quantity $\frac{m_B}{r_B}$: total demand increases, requiring an increase in the price to recover market clearing. At the new market-clearing price, Q_A is smaller (see expression 15), hence by market clearing Q_B (i.e., expression 16) must be larger. Therefore, the ratio Q_A/Q_B is smaller, proving that $\widehat{e}_B$ remains a one-share-one-vote equilibrium at the new higher lever of $\frac{m_B}{r_B}$. This shows that

the set of values of $\frac{m_B}{r_B}$ for which $\widehat{e}_B$ is a one-share-one-vote equilibrium is an interval of the form $(\underline{K}, \infty)$ for some $\underline{K}$.

Showing that $\underline{K} < \overline{K}$. Since by assumption $h_A(\widehat{e}_B) = h_B(\widehat{e}_B)$, the ratio Q_A/Q_B equals identically $\frac{m_A}{r_A}/\frac{m_B}{r_B}$ at $e^* = \widehat{e}_B$. Since one-share-one-vote equilibria with $e^* = \widehat{e}_B$ exist if and only if this ratio is below 1, we have $\underline{K} = \frac{m_A}{r_A}$. Set $\frac{m_B}{r_B} = \underline{K}$ and let $e^* = \widehat{e}_A$. Now, the ratio Q_A/Q_B is uniformly bounded above 1 for any equilibrium price (recall that equilibrium prices cannot be arbitrarily large). Since, as discussed at page 16, a stock market equilibrium exists for any constellation $(\frac{m_B}{r_B}, \frac{m_A}{r_A}, e)$, a stock market equilibrium for $e^* = \widehat{e}_A$ exists and, in this equilibrium, $Q_A/Q_B > 1$. By continuity, for values of $\frac{m_B}{r_B}$ slightly exceeding $\underline{K}$, a stock market equilibrium with the same features exists. Therefore, we have proved that there is an interval of values of $\frac{m_B}{r_B}$ larger than $\underline{K}$ for which one-share-one-vote equilibria exist with $e^* = \widehat{e}_A$. Let $\overline{K} > \underline{K}$ denote the sup of the interval, and our proof is done. □

Proof of Proposition 5

Proof. First, all the notation in this proof refers to firm i, but we omit the index i to streamline the notation. Second, it suffices to prove the result for aggregate demand: the results for individual demand follow since m_A and m_B are fixed. Now, to the proof.

Let p^* denote the stock-market equilibrium price for ESG level e, and let p'^* denote the stock-market equilibrium price for ESG level e'. For any $e \in (\widehat{e}_B, \widehat{e}_A)$, concavity of u_t in e together with Assumption 2 implies that $\mu(e) + h_A(e)$ is increasing in e and $\mu(e) + h_B(e)$ is decreasing in e. Therefore, $Q^A(p^*; e') > Q^A(p^*; e)$ and $Q^B(p^*; e') < Q^B(p^*; e)$.

Case I: Suppose that total demand at the old price given e' is no smaller than supply: formally, $Q^A(p^*; e') + Q^B(p^*; e') \geq Q^T$. Then the new equilibrium price p'^* must be no smaller than p^*. But then we have:

$$Q^B(p'^*; e') \leq Q^B(p^*; e') < Q^B(p^*; e). \tag{17}$$

Market clearing then implies that $Q^A(p'^*; e') > Q^A(p^*; e)$, showing that indeed type A's individual and aggregate holdings of firm i's stock are greater (and, consequently, type B's are smaller) under e'_i than under e_i.

Case II: Suppose that total demand at the old price given e' is below supply: formally, $Q^A(p^*; e') + Q^B(p^*; e') < Q^T$. Then the new equilibrium

price p'^* must be smaller than p^*. But then we have:

$$Q^A\left(p'^*; e'\right) > Q^A\left(p^*; e'\right) > Q^A\left(p^*; e\right). \tag{18}$$

Market clearing then implies that $Q^B\left(p'^*; e'\right) < Q^B\left(p^*; e\right)$ showing, again, that indeed type A's individual and aggregate holdings of firm i's stock are greater (and, consequently, type B's are smaller) under e_i' than under e_i. □

Proof of Proposition 6

Proof. Let's start with parts 1 and 2. As the whole economy becomes overwhelmingly made up of type-t investors, the vote of large funds $\widetilde{e}_i$ converges to $\widehat{e}_{i,t}$ for all i (Proposition 2), and the mass of shares held in type-t small funds, which vote $\widehat{e}_{i,t}$, overwhelms those held in small funds of the other type. Therefore, the share-weighted median vote converges to or equals $\widehat{e}_{i,t}$.

For part 3, the idea is to find an "intermediate" value $\frac{m_B}{r_B}$ such that aggregate demand of non-captive type A's exactly counterbalances that of non-captive type B's, thus making large funds the median voter. To this end, we will leverage the mean value theorem. The aggregate demand functions of non-captive investors at a putative equilibrium where the median voter votes $\widetilde{e}_i$ are:

$$Q^A\left(p_i^*; \widetilde{e}_i\right) = \frac{m_A}{2\sigma^2 r_A}\left[\mu_i(\widetilde{e}_i) + h_{i,A}(\widetilde{e}_i) - p_i^*(1+c)\right] \tag{19}$$

$$Q^B\left(p_i^*; \widetilde{e}_i\right) = \frac{m_B}{2\sigma^2 r_B}\left[\mu_i(\widetilde{e}_i) + h_{i,B}(\widetilde{e}_i) - p_i^*(1+c)\right], \tag{20}$$

where $\widetilde{e}_i$ is the ESG level that solves problem (6), and p_i^* clears the market for shares of firm i. Both $\widetilde{e}_i$ and p_i^* are endogenous to $\frac{m_B}{r_B}$. However, inspecting eq. (20) reveals that taking $\frac{m_B}{r_B}$ to zero causes $Q^B\left(p_i^*; \widetilde{e}_i\right)$ to go to zero, so non-captive type A's soak up all the residual supply not purchased by large funds. Conversely, taking $\frac{m_B}{r_B}$ to infinity causes $\widetilde{e}_i$ to converge to $\widehat{e}_{i,B}$, so satisfying equations (19) and (20) requires $Q^A\left(p_i^*; \widetilde{e}_i\right)$ to converge to zero and non-captive type B's to absorb all the residual supply not purchased by large funds. This shows that Q_A and Q_B switch their rank order as $\frac{m_B}{r_B}$ varies over the positive real line. Since these two quantities vary continuously with $\frac{m_B}{r_B}$, there must be a level of $\frac{m_B}{r_B}$ at which $Q^A\left(p_i^*; \widetilde{e}_i\right) = Q^B\left(p_i^*; \widetilde{e}_i\right)$. At this particular level, the mass $(1-\lambda)$ of non-captive investors split their purchase evenly: the non-captive type A's purchase the same amount of shares as the non-captive type B's. Hence, the median voters are the fraction λ of investors who are captive, all of whose shares are voted $\widetilde{e}_i$, consistent with the putative equilibrium. This concludes

the proof. □

Appendix B: Construction of Figures 2 and 3

In four different waves on Prolific, we surveyed 440 US retail investors between October and November 2024. We screened out non-investors by asking whether they have any savings invested in the stock market. We asked respondents to describe their political views on a 9-item scale from Liberal Democrat to Conservative Republican. In Figure 2, we code any Democrats plus Liberal Independents as Democrats, we drop Moderate Independent, and the rest we code as Republicans.

Questions for Figure 2 Answers to both questions were elicited on a scale from 1 (Strongly Oppose) to 7 (Strongly Support)

Gender issues *A company that you invest in has a plan to hire and promote more women, even if that requires giving them some priority over men. How much do you support or not support the company's plan?*

Climate issues *A company that you invest in has a plan to cut carbon emissions to make the air cleaner, even if profits could be lost. How much do you support or not support the company's plan?*

The responses were standardized within each wave, then aggregated across waves to produce Figures 2.

Question for Figure 3 We ask the following question.

Assume an investment in the S&P500 is expected to yield a $100 profit. Two investment funds are available: &P500, and generates a $100 profit. Fund B, which invests in the S&P500, generates a $100 profit, and uses a part of this profit to buy carbon credits to offset CO2 emissions. (1 ton of CO2 emission offsets cost about $50. The average American person has a carbon footprint of about 16 tons per year). Which fund would you invest in? Please keep in mind that for this question we will extract 1 survey participant via lottery who will receive a carbon offset certificate for the amount they specify and the rest, $100 minus that amount, in cash.

- *I would like to invest in Fund A and, if selected, get the full $100*
- *I would like to invest in Fund B and in the next question I will specify the $ amount I would like the fund to use to buy a carbon offset certificate so that, if selected, I receive $100 minus that amount in cash, and the carbon certificate*

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