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CITIZENS VS. SHAREHOLDERS

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ABSTRACT

We study the interplay between a "one person-one vote" political system and a "one share-one vote" corporate governance regime. The political system sets Pigouvian subsidies, while corporate governance determines firm-specific public good investments. Our analysis highlights a two-way feedback effect. In a frictionless economy, shareholder democracy is irrelevant: the political system fully offsets any effects of shareholder influence. With frictions in public policy provision, pro-social corporations fill the void of a dysfunctional regulatory system and increase the provision of public goods-demonstrating the benefit of shareholder democracy. Nevertheless, shareholder democracy can hurt a typical citizen because of the representation problem: it favors the preferences of the wealthy. If shareholders have extreme views, there can be a backlash against ESG initiatives, and the political system may undo or tax corporate social responsibility measures. Advancements in financial technologies that increase investor diversification or enable pass-through voting have important implications for these trade-offs of shareholder democracy.

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1 Introduction

Concerns that public policy and regulation have been ineffective in addressing societal challenges such as climate change, due in part to political system shortcomings, have led financial markets to become more involved. Investor activism promoting socially responsible corporate practices, the rise in environmental and social (E&S) shareholder proposals, and the expansion of impact investing, all demonstrate how "shareholder democracy" is pushing companies to consider broader societal interests alongside profit maximization.

While the literature has made substantial progress in understanding the effects of such shareholder engagement taking the limitations of the political system as given, it is important not to overlook how it interacts with the political process itself. The increased investor involvement in E&S issues feeds back into the political system, prompting it to respond to these developments. A notable example is the growing politicization of ESG matters and the resulting backlash, evident in the introduction of anti-ESG bills in 37 states and the adoption of some form of anti-ESG legislation in 22 states.[1]

In this paper, we analyze the interplay between political democracy and shareholder democracy in the provision of public goods. How do political outcomes respond to the developments in financial markets? Do such responses enhance or diminish the effectiveness of shareholder democracy compared to a governance regime that prioritizes profit maximization by firms, as advocated by Friedman?[2] What is the role of wealth inequality and the divergent voting rules of political and shareholder democracy – "one person-one vote" vs. "one share-one vote"? And how are these dynamics affected by innovations in investor diversification technologies and pass-through corporate voting systems?

Our analysis reveals a nuanced interaction between political and shareholder democracy. We show that in a frictionless economy, shareholder democracy is irrelevant: voting in political elections leads to policies that fully offset firm-level decisions. However, if there are frictions that make public policy socially costly, shareholder democracy and the

[1] See, e.g., "Wave of 'Anti-ESG' Investing Legislation, New Study Found," *Forbes*, Aug 29, 2023, and the 2023 report by Pleiades Strategy, a climate risk consulting firm.

[2] See "A Friedman doctrine: The social responsibility of business is to increase its profits" by Milton Friedman, *The New York Times Magazine*, September 13, 1970.

Friedman doctrine are no longer equivalent. Shareholder democracy can reduce the social costs of public policy, but may favor the preferences of the wealthy, who have outsized influence in shareholder elections. Greater investor diversification and the emergence of "universal owners" can further exacerbate the preference representation problem of shareholder democracy, resulting in strong ESG backlash.

We derive these insights using a model of public good provision (e.g., green investment) by firms. There is a large number of firms and households, who do not fully internalize the effect of their actions on aggregate outcomes. In the first stage, households vote in political elections on a Pigouvian subsidy to incentivize public good investments by firms. In the second stage, firms decide how much to invest in a public good. While we frame the problem as one of public good provision, it can equivalently be interpreted as discouraging firms from investing in a public bad (e.g., pollution) through a Pigouvian tax, such as a carbon tax.

We compare two different firm mandates: (i) profit maximization, following Friedman, where firms exclusively focus on maximizing financial profits, and (ii) shareholder democracy, where each firm's shareholders vote on the firm's public good investment. Under profit maximization, firms' investments in public goods are driven by financial incentives from subsidies, whereas under shareholder democracy, warm-glow preferences and shareholders' direct utility from the public good may motivate them to support public good investments by the firms they own, even absent financial incentives.

In the model, there are two key sources of household heterogeneity. First, households are endowed with heterogeneous ownership shares in firms, which reflects wealth inequality. Wealth inequality implies that some households may hold outsized influence under the "one share-one vote" rule of shareholder democracy. Second, households have heterogeneous preferences regarding public good provision, including varying degrees of warm-glow utility, reflecting disagreements about social issues. As we show, both sources of heterogeneity imply that the median shareholder's preferred level of public good investments may differ from the median citizen's preference.[3]

[3] The preferences of citizens and shareholders are such that we can apply the median voter theorem to both political and shareholder voting, which implies that in each case, the outcome of the vote is

Our first result shows that when the subsidy is set through a political process, shareholder democracy is irrelevant: the equilibrium level of public good provision under shareholder democracy is the same as under profit maximization. The central force behind the irrelevance result is that, through political elections, the equilibrium subsidy endogenously responds to the expected choices by firms. For example, if the median shareholder is very pro-social (e.g., because of high warm-glow utility), then shareholder democracy prompts firms to adopt a high level of public good investment. Anticipating this, the median citizen supports a smaller Pigouvian subsidy, thereby fully offsetting the shareholders' pro-social stance. This mechanism resembles "ESG backlash:" the political system counteracts the pro-ESG efforts of the financial market. In fact, if the median shareholder is much more pro-social than the median citizen, the equilibrium public policy may even feature a tax on the public good to correct for what the median citizen views as excessive public good investment.

The irrelevance of shareholder democracy crucially relies on the absence of frictions in public policy provision. To capture the imperfection in public policy, we assume that firms can engage in costly diversion activities (e.g., green-washing) to secure a larger subsidy. Such diversion reflects a moral hazard problem between firms and policy makers, and the associated costs of diversion present a deadweight loss.[4]

With public policy imperfections, political voting does not fully offset the effects of shareholder influence, so shareholder democracy and profit maximization are no longer equivalent. We show that either of these systems can be optimal from a typical citizen's perspective, and the comparison between them depends on two key characteristics of ownership distribution across firms. The first is the extent to which some citizens hold more weight in firms' ownership compared to others (wealth inequality). The second is the proportion of firms in the economy owned by each citizen (the level of investor diversification).

The key benefit of shareholder democracy is that if shareholders are pro-social, it

determined by the preferences of the median voter within the respective group.

[4]Our main results remain unchanged if we capture the imperfection of public policy in a more reduced form way: as a deadweight loss increasing in the total level of the subsidy (which could reflect the costs of bureaucracy and other inefficiencies of public policy).

can achieve a given level of public good provision with a smaller Pigouvian subsidy. As a result, shareholder democracy can reduce the deadweight loss of incentivizing public goods compared to profit maximization. Intuitively, the subsidy and shareholders' pro-socialness are not perfect substitutes in promoting public goods: while the subsidy encourages diversion, pro-social preferences motivate genuine public good investments.

This benefit does not necessarily mean that shareholder democracy makes a typical citizen better off. The equilibrium level of public good provision is skewed toward what shareholders prefer, rather than what a typical citizen prefers. This disparity arises due to the "one share-one vote" rule, representing a potential cost of shareholder democracy. We show that a citizen is better off under shareholder democracy than under profit maximization only if the median shareholder's pro-social preferences are not significantly stronger than those of the citizen.

Wealth inequality can thus create a preference representation problem: if wealthier citizens prefer a higher level of public good provision than typical citizens do, then shareholder democracy—favoring wealthier citizens due to their larger ownership stakes—can make citizens worse off than profit maximization. However, wealth inequality also has a counteracting effect that may limit the representation problem of shareholder democracy. Very wealthy investors, who own substantial ownership stakes, internalize a larger share of the costs of public good provision by the firms they own, which limits their incentives to be overly pro-social. Therefore, the net impact of wealth inequality on the costs and benefits of shareholder democracy depends on the balance between these opposing effects.

The degree of investor diversification plays an important role in these dynamics. We show that as shareholders' portfolios become more diversified, the level of public good provision under shareholder democracy increases. Essentially, diversified shareholders are endogenously more pro-social. This is because when investors' wealth is spread across more firms, they hold smaller stakes in individual firms, thus internalizing a lower share of the cost of public good provision while still reaping its benefits. Furthermore, firms owned by diversified shareholders are less prone to diversion: with investments spread across multiple firms, diversified shareholders internalize a greater share of the associated deadweight losses. In fact, if shareholders are perfectly diversified, no wasteful diversion occurs under shareholder democracy, whereas it always occurs under profit maximization.[5] These conclusions underscore the potential of "universal owners" – diversified investors with a stake in the entire economy – to play a significant role in addressing issues like climate change.

The benefits of investor diversification notwithstanding, it can also exacerbate the preference representation problem of shareholder democracy, leaving a typical citizen at a further disadvantage. The political system then endogenously responds by implementing even deeper subsidy cuts. Thus, greater investor diversification can intensify the ESG backlash. This result is consistent with the rise of index investing preceding the growth of ESG backlash as a political phenomenon, and with index funds often being the targets of anti-ESG regulation.[6]

Our framework is flexible and suitable for studying various extensions relevant in the context of political and corporate democracy. Our baseline model assumes that all shareholders directly participate in voting. In the current environment, where households typically own shares in companies through funds, households do not vote directly but delegate their votes to fund managers. In an extension, we show that if a subset of investors holds their shares through a fund that votes on their behalf, this can exacerbate the preference representation problem of shareholder democracy. In such a scenario, a "pass-through voting" system, which gives back the voting power to the underlying investors (Fisch and Schwartz, 2023), can limit the preference representation problem. An implication of this result is that the move from profit maximization to shareholder democracy should be accompanied by enabling "pass-through voting," in line with recent developments in the industry (Blackrock, 2022; Malenko and Malenko, 2024).

Given our focus on the interplay between politics and business, it is natural to explore the effects of corporate lobbying within our model. We conceptualize lobbying as a costly activity that increases subsidies to firms beyond public policy decisions made at the

[5]For this reason, if shareholders are perfectly diversified, the first best could be attained under shareholder democracy, but can never be attained under profit maximization.

[6]See, for example, "BlackRock and State Street Grilled by Texas Lawmakers in ESG Debate," *Bloomberg*, December 15, 2022. See Section 4.2.2 for additional examples.

political stage. In equilibrium, lobbying precipitates its own form of backlash: citizens cut subsidies in an effort to counteract the distorting impact of lobbying. Despite this, the distorting impact of lobbying persists, leading to decreased welfare for the median citizen and lower profitability for all firms. We also show that firms lobby less under shareholder democracy, since shareholders internalize the inevitable increase in the tax burden induced by lobbying. Thus, compared to the profit-maximizing regime, shareholder democracy mitigates the adverse effects of lobbying and is more likely to yield welfare improvements.

Related Literature. Our paper contributes to the growing literature on socially responsible investing.[7] This literature highlights two key mechanisms of investor influence: exit (i.e., exclusion and divestment) and voice (i.e., engagement and voting). Our paper focuses on voice, and shareholder voting in particular. Within this literature, our work is more closely related to studies that explore the interaction between regulation and financial markets (Bensoussan et al., 2023; Biais and Landier, 2022; Döttling and Rola-Janicka, 2023; Huang and Kopytov, 2023; Inderst and Opp, 2024; Oehmke and Opp, 2022; Piatti et al., 2023). Differently from these studies, our paper concentrates on the political dynamics that influence regulatory outcomes. Allen et al. (2024) and Carlson et al. (2023) also examine the relation between political processes and financial markets. Allen et al. (2024) study how the availability of sustainability-linked debt instruments affects agents' political support for Pigouvian taxes. Carlson et al. (2023) examine an institution's decision to divest brown assets and show how divestment can increase stakeholders' political support to strand the asset through government regulation. Our paper studies different questions and mechanisms, focusing on how various corporate governance regimes shape political preferences in the presence of wealth inequality.

We also contribute to the literature on shareholder voting,[8] including studies of voting on socially responsible policies (Broccardo et al., 2022; Gollier and Pouget, 2022; Hart

[7]See, e.g., Barbalau and Zeni (2023), Bisceglia et al. (2023), Chowdhry et al. (2019), Green and Roth (2024), Edmans et al. (2023), Goldstein et al. (2022), Gupta et al. (2024), Heinkel et al. (2001), Landier and Lovo (2023), Oehmke and Opp (2024), and Pástor et al. (2021). See Matos (2020) and Gillan et al. (2021) for reviews.

[8]See, e.g., Bar-Isaac and Shapiro (2020), Dhillon and Rossetto (2015), Levit and Malenko (2011), Levit et al. (2024a,b), Maug (1999), Van Wesep (2014), Zachariadis et al. (2020), Zwiebel (1995).

and Zingales, 2017). This literature does not examine the interaction between shareholder voting and the political system, which is the focus of our paper. In addition, we add to this literature by studying very general ownership structures in a unified framework, both within firms (by analyzing shareholders with heterogeneous ownership stakes and heterogeneous preferences) and across firms (by studying investor diversification and shareholders' holdings across multiple firms). This allows us to examine how the distribution of ownership and wealth inequality affect corporate outcomes and, in turn, feed back into the political process.

Early contributions in the political economy of finance literature study how political regimes and the balance of power between various firm stakeholders shape equilibrium rules on corporate governance (Bebchuk and Neeman, 2010; Pagano and Volpin, 2005; Perotti and Von Thadden, 2006; Ševčík, 2012) and other institutional features of financial markets (Biais and Mariotti, 2009; Biais and Perotti, 2002; Rajan and Zingales, 2003). We relate to this work by exploring the interplay between shareholders, corporate governance regimes, and politics, but stand out by focusing on the implications for public good provision, which allows us to contribute to the debate on the role of corporations in addressing social challenges.

We also relate to the literature on public and "private politics," which studies how profit-oriented firms may choose to self-regulate when they face government regulation, activist groups and NGOs, or customers who value sustainable products (Baron, 2003, 2014; Besley and Ghatak, 2007; Besley and Persson, 2023; Egorov and Harstad, 2017; Maxwell et al., 2000). In contrast to this literature, we study the interaction between public politics and the firm's corporate governance regime, focusing on the role of firms' ownership structures and the effects of shareholder democracy.

2 Model Setup

Consider an economy with m firms indexed by j and n households indexed by i. There are two stages. In the first stage, households vote in political elections as citizens. In the second stage, firms decide how much to invest in a public good.

Firm Ownership. Households have heterogeneous ownership stakes $\alpha_{ij} \in [0,1]$ in firms. To be able to analyze different ownership distributions in a unified framework, we assume there are $K \geq 1$ distinct types of households per firm indexed by k, so that the total number of households is $n = K \times m$. We denote by $k(i)$ the type of household i. Households of the same type have the same wealth and same benefits from investment in the public good, as described below. Therefore, they share identical preferences over firm policies, as shown in Section 3. We assume that shareholder types are equally distributed across firms, so that firms are symmetric in their ownership structures.

We capture the degree of investor diversification by the parameter μ. Specifically, each household owns shares in a fraction μ of firms, where μ can take any value in $\{\frac{1}{m}, \frac{2}{m}, ..., 1\}$ as long as $\frac{1}{\mu}$ is an integer.[9] A higher μ corresponds to greater diversification. Each household divides his wealth equally among the $m\mu$ firms in his portfolio. To preserve the symmetry in ownership structures across firms, we assume that all households of a given type are evenly split into $\frac{1}{\mu}$ groups, where each group has $m\mu$ households and holds its own set of firms, which does not overlap with the firms held by other groups. Specifically, we define $\omega_i \in [0,1]$ as the combined stake owned by household i across all firms, and assume $\alpha_{ij} = \frac{\omega_i}{m\mu} > 0$ if firm j is in the portfolio of household i, and $\alpha_{ij} = 0$ otherwise, so that $\sum_{j=1}^{m} \alpha_{ij} = \omega_i$. In addition, since households of the same type have the same wealth, ω_i is also the share of each firm that is collectively owned by households of the same type as i.[10]

This setup allows us to cleanly isolate the effects of diversification because, irrespective of μ: (i) household types are equally distributed across firms; and (ii) household i's average ownership share in all firms is $\bar{\alpha}_i \equiv \frac{1}{m}\sum_{j=1}^{m} \alpha_{ij} = \frac{1}{m} m\mu(\frac{\omega_i}{m\mu}) = \frac{1}{m}\omega_i$. Given that households have no other assets, differences in ω_i essentially reflect wealth inequality across types.

[9]The assumption that $\frac{1}{\mu}$ is an integer implies that μ cannot take values $1/2 < \mu < 1$. Otherwise, it is not restrictive for large m.

[10]In other words, $\sum_{r:k(r)=k(i)} \alpha_{rj} = \omega_i$. We formally show this in the Appendix, where we also illustrate it using the example in Figure 1.

Figure 1 illustrates how our setup can capture different ownership distributions using the following example. Suppose there are $m = 6$ firms and $K = 2$ types of households, B(lue) and R(ed), with $\omega_i = 0.4$ for blue types and $\omega_i = 0.6$ for red types. Then there are $n = 12$ households, of which $i \in \{1, ..., 6\}$ are of type B, and $i \in \{7, ..., 12\}$ of type R. If $\mu = \frac{1}{3}$, as in the second row of the figure, then households are split into $\frac{1}{\mu} = 3$ groups of 2 households each. The first two households of type B hold a share $\alpha_{11} = \alpha_{12} = \alpha_{21} = \alpha_{22} = \frac{\omega_i}{6\times\frac{1}{3}} = 0.2$ in firms $j = 1, 2$, and no shares in firms $j = 3, 4, 5, 6$ ($\alpha_{1j} = \alpha_{2j} = 0$ for $j = 3, 4, 5, 6$). The next two households of type B hold a share 0.2 in firms $j = 3, 4$, and no shares in firms $j = 1, 2, 5, 6$, and so on. Similarly, with $\mu = \frac{1}{3}$ each household of type R holds exactly two firms, with a stake 0.3 in each.

Overall, this setup allows us to study very general ownership structures, both within and across firms. There are two notable limit cases. The first is when each shareholder holds only one firm, $\mu = \frac{1}{m}$ (as in the first row of Figure 1), and there are infinitely many firms, $m \to \infty$, so that $\mu \to 0$. This is an economy with undiversified, atomistic shareholders. The second important limit case is $\mu = 1$, where shareholders are fully diversified universal owners who hold a stake in every firm in the economy. This case is illustrated in the last row of Figure 1.

Firm Technology. Each firm can invest x_j in a public good at a convex cost $\Phi(x_j) = \frac{\phi}{2}x_j^2$. Individual firms' investments in the public good aggregate to $X = \sum_{j=1}^{m} x_j$.

Households get a positive utility benefit from the aggregate public good X. Additionally, they receive warm-glow utility $g_i \geq 0$ from public good investments by the firms they own. Differences in warm glow capture disagreements about corporate social responsibility due to moral convictions, e.g., how much profit the firm should sacrifice in order to reduce pollution. As common in the literature on socially responsible investing (e.g., Pástor et al., 2021), we assume that this warm-glow utility is proportional to households' ownership stake in the firm. This assumption captures the idea that shareholders feel good about aligning their portfolio companies with their moral convictions, and implies that the total warm-glow utility of household i is $\sum_{j=1}^{m} g_i x_j \alpha_{ij}$. Denoting i's consumption by C_i, the household's utility function is defined as

$$U_i = \frac{\gamma_i}{n} X + \sum_{j=1}^{m} g_i x_j \alpha_{ij} + C_i. \tag{1}$$

The parameter $\gamma_i > 0$ measures i's marginal utility from the public good. We scale it by n to ensure that the *aggregate* marginal value of the public good does not explode when we consider the limit $n \to \infty$. Otherwise, it would be socially optimal in the model to provide an infinite amount of the public good. Scaling by n ensures that the aggregate marginal utility is equal to the average value of γ_i, irrespective of n.[11]

Overall, households can differ in their wealth ω_i and preferences γ_i and g_i, but all households of a given type have the same $(\omega_i, \gamma_i, g_i)$. Given our assumption that types are equally distributed across firms, firms' equilibrium decisions will be symmetric.

First Stage: Public Policy. In the first stage, households participate in political elections to determine public policy, which involves a per-unit Pigouvian subsidy σ to incentivize public good provision by firms. In particular, two politicians compete in a majoritarian election by proposing specific subsidy levels, and households cast their votes for one of the two politicians.[12]

We assume that there is a moral hazard problem in the provision of public policy: firms' true public good investments are not observed. In particular, only $x_j + y_j$ is observed, so that firm j receives a subsidy of $\sigma(x_j + y_j)$, where y_j is the effort it puts into diverting the subsidy (e.g., greenwashing activities). Diversion comes at a quadratic cost $\Psi(y) = \frac{\phi}{2\delta} y^2$ to the firm. The parameter δ governs the ease with which firms can divert. Setting $\delta = 0$ would rule out diversion by making it infinitely costly.

The total tax burden to fund the subsidy is $T = \sigma \sum_{j=1}^{m} (x_j + y_j)$, and we denote by τ_i the share of the total tax burden paid by household i. A balanced budget requires that

[11] In Online Appendix B.4, we analyze the model with marginal utility not scaled by n, and show that the main results are similar but that we cannot consider the limit case.

[12] In practice, political voting is sometimes directly linked to climate policy, as in the 2010 California referendum, the 2016 and 2018 Washington carbon tax referendums, or the 2023 Swiss referendum (Heeb et al., 2024). In other instances, climate issues are very salient in political elections, even if they are not directly on the agenda (Ramelli et al., 2021; Burgess et al., 2024).

$\sum_{i=1}^{n} \tau_i T = T$. As a benchmark, we consider $\tau_i = \bar{\alpha}_i$. This can be interpreted as a wealth tax and ensures that there are no redistributional effects from the subsidy or taxes.[13] While we model the problem as incentivizing public good provision, it can equivalently be interpreted as implementing a Pigouvian tax (e.g., a carbon tax) to discourage firms from creating a public bad such as pollution.

Second Stage: Firm Investment. In the second stage, each firm decides how much to invest in the public good (x_j) and in diversion (y_j). Firm j's profits are given by

$$\Pi(x_j, y_j) = \pi + \sigma(x_j + y_j) - \Phi(x_j) - \Psi(y_j), \tag{2}$$

where π denotes a firm's revenue from business operations and is large enough to ensure that profits are positive. We consider two different corporate governance regimes:

1. **Profit Maximization**: The firm's manager picks (x_j, y_j) to maximize financial profits of the firm, $\Pi(x_j, y_j)$, as advocated by the Friedman doctrine.

2. **Shareholder Democracy**: The firm's policies $(x_j,\, y_j)$ are determined by a shareholder vote. Shareholders' voting decisions are driven not only by financial motives but also by their warm-glow utility and concern about the public good itself.

   To ensure consistency in the way we model political elections and shareholder voting, we assume that two candidates – the firm's manager and an activist investor – compete in a majoritarian election by committing to a policy (x_j, y_j). Households vote as shareholders in firms they own, choosing between the two candidates.[14] The key difference from the political stage is that a shareholder's voting power is proportional to his ownership stake α_{ij}, whereas in political elections, each household has one vote.[15]

[13] We assume that politicians take as given the distribution of τ_i, reflecting pre-determined and sticky rules on redistribution.

[14] For example, in a proxy fight at Exxon, shareholders were picking between the incumbent management and an activist (Engine No. 1), who was proposing more environmentally-friendly policies. See "Exxon's Board Defeat Signals the Rise of Social-Good Activists," *The New York Times*, June 9, 2021.

[15] Our analysis focuses on voting as the governance mechanism through which shareholders exert influence. Engagement and the threat of exit are alternative mechanisms that could have similar effects

Household Budget. Profits are paid out to shareholders as dividends. Thus, household i's consumption is

$$C_i = \sum_{j=1}^{m} \Pi(x_j, y_j)\alpha_{ij} - \tau_i T.$$

2.1 First Best

As a benchmark, we establish the first-best investments, defined as those that achieve the highest level of utilitarian welfare. In particular, we solve the problem of a planner choosing x_j and y_j directly:

$$\begin{aligned}\max_{x_j, y_j} \sum_{i=1}^{n} U_i &= \sum_{i=1}^{n} \left[\frac{\gamma_i}{n} X + \sum_{j=1}^{m} g_i x_j \alpha_{ij} + C_i \right] \\ &= \bar{\gamma} \sum_{j=1}^{m} x_j + \sum_{i=1}^{n} \sum_{j=1}^{m} [\pi + g_i x_j - \Phi(x_j) - \Psi(y_j)]\alpha_{ij},\end{aligned}$$

where $\bar{\gamma} \equiv \frac{1}{n} \sum_{i=1}^{n} \gamma_i$. The second equality follows because the planner chooses x_j and y_j directly without using Pigouvian subsidies, so that $\sigma = \tau_i = 0$. In the first best, $y_j^{FB} = 0$ for all j because diversion is socially costly. The first-order condition for public good provision yields the first-best level of x_j:

$$x_j^{FB} = \frac{\bar{\gamma} + \bar{g}}{\phi}, \tag{3}$$

where $\bar{g} \equiv \sum_{i=1}^{n} g_i \alpha_{ij}$ is the weighted average g_i of shareholders in firm j. It is the same for all firms because, by assumption, shareholder types are evenly distributed across firms.

3 Analysis

We solve the model by backward induction. We start with firms' investment decisions given subsidy σ, and then analyze political voting on the subsidy, taking into account firms' expected reactions in the second stage.

(McCahery et al., 2016). Our key assumption is that a shareholder's influence is positively related to his stake in the firm.

3.1 Second Stage: Firms' Public Good Investments

This section derives the equilibrium x_j and y_j chosen by each firm in the second stage for a given subsidy σ, under both profit maximization and shareholder democracy.

3.1.1 Profit Maximization

Under profit maximization, shareholders have no say on E&S issues and managers pick (x_j,y_j) to maximize financial profits $\Pi(x_j, y_j)$ given by (2). The first order conditions for x_j and y_j imply optimal levels of, respectively,

$$x^p(\sigma) = \frac{\sigma}{\phi}, \tag{4}$$

$$y^p(\sigma) = \frac{\delta\sigma}{\phi}. \tag{5}$$

The superscript p stands for "profit maximization." Under this mandate, firms only provide the public good if they are incentivized to do so by the subsidy. However, the subsidy also encourages firms to divert, whenever the cost of doing so is not prohibitive, $\delta > 0$. Such diversion results in a deadweight loss $\Psi(y_j^p) = \frac{\delta\sigma^2}{2\phi}$, which increases in σ.

3.1.2 Shareholder Democracy

Under shareholder democracy, households vote on firms' public good investments as shareholders. To find shareholder i's policy preference, we solve the following problem:

$$\max_{x_j, y_j} U_i = \sum_{j=1}^{m} \frac{\gamma_i}{n} x_j - \tau_i T + \sum_{j=1}^{m} \left[\Pi(x_j, y_j) + g_i x_j\right] \alpha_{ij}. \tag{6}$$

A balanced government budget implies an aggregate tax burden $T = \sigma \sum_{j=1}^{m}(x_j + y_j)$, of which household i pays a fraction τ_i. The first order conditions for x_j and y_j are, respectively,

$$\Phi'(x_j)\alpha_{ij} = \frac{\gamma_i}{n} + g_i\alpha_{ij} + \sigma\left(\alpha_{ij} - \tau_i\right), \tag{7}$$

$$\Psi'(y_j)\alpha_{ij} = \sigma\left(\alpha_{ij} - \tau_i\right). \tag{8}$$

The household's preferred level of public good investment is determined both by financial considerations related to the subsidies (the last term in (7)) and by the household's intrinsic motives (the first two terms in (7)). The subsidy provides a financial incentive for investing in public goods, but also motivates diversion. At the same time, shareholders internalize the impact of a higher subsidy on the tax bill T. Shareholder i benefits from a fraction α_{ij} of the subsidy and pays for a fraction τ_i of the tax bill. Therefore, the marginal benefit of providing public goods (and diversion) related to the subsidy is $\sigma(\alpha_{ij} - \tau_i)$.

As noted in the setup, to abstract from the distributional effects of taxes, we assume $\tau_i = \bar{\alpha}_i$. Also recall that $\alpha_{ij} = \frac{\omega_i}{m\mu}$ and $\bar{\alpha}_i = \frac{\omega_i}{m}$. Taking this into account and using the quadratic cost functions, we can derive shareholder i's preferred level of public good investment and diversion by firm j as, respectively,

$$x^s(\sigma, g_i, \gamma_i, \omega_i) = \frac{\mu \frac{\gamma_i}{K\omega_i} + g_i + \sigma(1-\mu)}{\phi}, \tag{9}$$

$$y^s(\sigma) = \frac{\delta\sigma(1-\mu)}{\phi}, \tag{10}$$

where the superscript s stands for "shareholder democracy." Warm-glow preferences and the utility benefit of the public good provide shareholders with intrinsic incentives to invest in public goods. The marginal benefit per ownership share that is attributable to warm glow is g_i, and that due to the utility from the public good is $\frac{\gamma_i/n}{\alpha_{ij}} = \frac{\gamma_i/n}{\omega_i/m\mu} = \mu\frac{\gamma_i}{K\omega_i}$. To collect these intrinsic incentive effects, we define shareholder i's overall effective pro-socialness as

$$G_i^s \equiv \mu\frac{\gamma_i}{K\omega_i} + g_i. \tag{11}$$

and the shareholder's preferred public good investment (9) as $x^s(\sigma, G_i^s)$.

The role of diversification. Examining (9)–(11) allows us to understand the effects of diversification μ. As μ increases, households spread their wealth across a larger number of firms in the economy and thus own smaller ownership stakes in individual firms. Shareholders with smaller stakes have higher incentives to invest in public goods due to the utility benefit γ_i, as they internalize a lower share of the cost of public good provision but fully enjoy its benefits. Thus, keeping a household's wealth fixed, higher diversification makes shareholders endogenously more pro-social, increasing G_i^s.[16] For example, if shareholders are fully undiversified ($\mu = \frac{1}{m}$), then in the limit with a large number of firms and shareholders ($m \to \infty$), their intrinsic motive to invest in public goods comes exclusively from their warm-glow utility: $G_i^s = g_i$.

At the same time, diversification reduces the financial incentive effect of the subsidy because diversified shareholders internalize to a greater extent that a higher subsidy results in a larger tax bill: $\sigma(\alpha_{ij} - \tau_i)/\alpha_{ij} = \sigma(1-\mu)$ declines as μ increases. In fact, when shareholders are perfectly diversified, $\mu = 1$, they do not respond to subsidies at all. Finally, (10) shows that more diversified shareholders more fully internalize the deadweight loss from diversion, leading them to prefer a lower level of diversion.

Shareholder Voting. Note that all shareholders have the same preferred level of diversion $y^s(\sigma)$ and that we can rank the preferred $x^s(\sigma, G_i^s)$ along shareholders' effective pro-socialness G_i^s. Furthermore, (6) implies that shareholders' preferences are single-peaked in x. As we show in the proof of Lemma 1, these properties imply that the median voter theorem applies, i.e., both competing candidates offer the policies preferred by the median shareholder. Since the share of votes owned by agents of the same type as i is ω_i, the firm adopts policies $x^s(\sigma, \tilde{G}^s)$ and $y^s(\sigma)$, where $\tilde{G}^s$ denotes the weighted-median G_i^s among shareholders weighted by ω_i. We refer to the corresponding shareholder as the "median shareholder", and denote the median shareholder's wealth and preference parameters by $\tilde{\omega}^s$, $\tilde{\gamma}^s$, and $\tilde{g}^s$, such that $\tilde{G}^s = \mu\frac{\tilde{\gamma}^s}{K\tilde{\omega}^s} + \tilde{g}^s$.[17]

Given our assumption that households of a particular type have the same wealth and preferences and that types are equally distributed among firms, the weighted-median $\tilde{G}^s$ is the same across firms. Thus, all firms adopt identical policies.

[16] For the same reason, G_i^s decreases in household wealth ω_i: households with higher ω_i hold larger stakes and thus internalize a larger share of the cost of public good provision.

[17] For example, suppose that there are five types of households, with $G^s_{(1)} < ... < G^s_{(5)}$, where $G^s_{(k)}$ denotes the pro-socialness of type k, and let $\omega_{(k)}$ denote the combined stake of households of type k in each firm. Then, if $\omega_{(1)} = \omega_{(2)} = \omega_{(3)} = 0.10$ and $\omega_{(4)} = \omega_{(5)} = 0.35$, the median shareholder has type $k = 4$, whereas if $\omega_{(1)} = \omega_{(2)} = 0.35$ and $\omega_{(3)} = \omega_{(4)} = \omega_{(5)} = 0.10$, the median shareholder has type $k = 2$. Note also that since the median shareholder is determined based on G_i^s, it follows that $\tilde{\omega}^s$, $\tilde{\gamma}^s$, and $\tilde{g}^s$ do not generally correspond to the weighted medians of ω_i, γ_i, and g_i, respectively.

The following lemma summarizes these arguments and compares the outcomes under shareholder democracy and profit maximization.

Lemma 1 (Public Good Provision)**.**

1. For a given subsidy σ, each firm's public good investment and diversion are $x^p(\sigma)$, $y^p(\sigma)$ under profit maximization, and $x^s(\sigma, \tilde{G}^s)$, $y^s(\sigma)$ under shareholder democracy, as defined in Eqs. (4), (5), (9), and (10).

2. For any given level of public good x, if σ^p and σ^s are the subsidies required to implement x under profit maximization and shareholder democracy, respectively, then the difference in diversion is $y^p(\sigma^p) - y^s(\sigma^s) = \frac{\delta}{\sigma}\tilde{G}^s$.

Shareholder democracy can implement a given level of public good provision with a smaller level of diversion because shareholders are pro-social, $\tilde{G}^s > 0$. This highlights a key benefit of shareholder democracy: less diversion implies lower deadweight costs.

3.2 First Stage: Political Elections

In the first stage, households choose between two politicians who commit to a subsidy σ. To establish the equilibrium of this political game, we solve for the subsidy preferred by household i. A subsidy σ implies an aggregate tax burden $T = \sigma \sum_{j=1}^{m}(x_j + y_j)$, of which household i pays a fraction τ_i. Therefore, i's problem solves:

$$\max_{\sigma} \; U_i = \frac{\gamma_i}{n}X - \tau_i T + \sum_{j=1}^{m} \left[\Pi(x_j, y_j) + g_i x_j\right] \alpha_{ij}, \tag{12}$$

where x_j, y_j are the expected policies of firm j given subsidy σ. Note that voters anticipate that the provision of public good by the firms they own will bring them warm-glow utility in the future. That is, $\sum_{j=1}^{m} \alpha_{ij} g_i x_j$ enters their utility function in the first stage and affects their preferred level of the subsidy. We choose this as our baseline setting because it is consistent with standard expected utility theory. In Online Appendix B.3, we relax this assumption and instead allow for warm glow to be partially (or fully) ignored when forming preferences about the subsidy. The main results are qualitatively the same in such a setting, but the definition of social welfare is not straightforward, making it harder to evaluate the efficiency of the equilibrium outcomes.

Recall that firms have symmetric ownership structures and hence symmetric policies for any given governance regime (profit maximization or shareholder democracy): $x_j = x(\sigma)$ and $y_j = y(\sigma)$ for all j. In Appendix A.2, we solve the optimization problem (12) for general firms' strategies $x(\sigma), y(\sigma)$ and derive the following first order condition for citizens' policy preference over the subsidy σ:

$$[G_i^c - \Phi'(x(\sigma))] \frac{\partial x(\sigma)}{\partial \sigma} - \Psi'(y(\sigma)) \frac{\partial y(\sigma)}{\partial \sigma} = 0, \tag{13}$$

where

$$G_i^c \equiv \frac{\gamma_i}{K\omega_i} + g_i \tag{14}$$

is citizen i's effective pro-socialness. The key difference between shareholders' G_i^s in Eq. (11) and citizens' G_i^c in Eq. (14) is that G_i^c does not depend on the extent of investor diversification μ. Intuitively, when voting as shareholders in a given firm, households act more pro-socially when their stake in that firm is smaller (as they internalize less of the cost of public good provision), which happens when households are more diversified and spread their wealth across multiple firms. By contrast, when voting in political elections, households internalize the cost of public good provision for all firms in their portfolios. This cost is proportional to the average stake $\bar{\alpha}_i = \omega_i/m$, which does not depend on μ. For example, recall that in the limit case with undiversified shareholders and $m \to \infty$, so that $\mu = \frac{1}{m} \to 0$, shareholders' pro-socialness collapses to their warm glow, $G_i^s = g_i$. In contrast, citizens' G_i^c remains a function of γ_i in this limit case as well.

Next, we combine Eq. (13) and the expressions for $x(\sigma), y(\sigma)$ under profit maximization and shareholder democracy characterized by Lemma 1, to derive citizens' preferred subsidies and the equilibrium public good provision in these two cases.

3.2.1 Profit Maximization

Eqs. (4), (5), and (13) imply that household i's preferred subsidy is

$$\sigma^p(G_i^c) = \frac{G_i^c}{1+\delta}, \tag{15}$$

We can rank citizens' preferred subsidy $\sigma^p(G_i^c)$ along their effective pro-socialness G_i^c. Appendix A.2 shows that preferences are single-peaked in σ, so that the median voter theorem applies. Thus, the equilibrium subsidy is $\sigma^p \equiv \sigma^p(\tilde{G}^c)$, i.e., the subsidy preferred by the citizen with the median level of G_i^c, denoted $\tilde{G}^c$. Eqs. (4) and (5) imply that the equilibrium level of public good provision and diversion are given by

$$x^p(\sigma^p) = \frac{\tilde{G}^c}{(1+\delta)\phi}, \tag{16}$$

$$y^p(\sigma^p) = \frac{\delta\tilde{G}^c}{(1+\delta)\phi}. \tag{17}$$

3.2.2 Shareholder Democracy

Eqs. (9), (10), and (13) imply that, for any $\mu < 1$, household i's preferred subsidy is

$$\sigma^s(G_i^c) = \frac{G_i^c - \tilde{G}^s}{(1+\delta)(1-\mu)}. \tag{18}$$

If $\mu = 1$, i.e., shareholders are perfectly diversified, firms' policies do not respond to the subsidy, so citizens are indifferent with respect to the level of the subsidy.[18] We discuss this case in Section 4.1 and focus on $\mu < 1$ here. With $\mu < 1$, citizens' preferences can be ranked by G_i^c and are single-peaked. Thus, the median voter theorem again applies, and the equilibrium subsidy is $\sigma^s \equiv \sigma^s(\tilde{G}^c)$. Eqs. (9) and (10) imply that the equilibrium

[18] In this case, the citizen's preferred subsidy is indeterminate because $\frac{\partial x(\sigma)}{\partial\sigma} = \frac{\partial y(\sigma)}{\partial\sigma} = 0$, and thus U_i in Eq. (12) does not depend on σ. The equilibrium firm policies are solely determined by shareholders' pro-social preferences and given by $x^s = \frac{\tilde{G}^s}{\phi}$ and $y^s = 0$.

public good investment and diversion under shareholder democracy are

$$x^s(\sigma^s) = \frac{\tilde{G}^c + \delta\tilde{G}^s}{(1+\delta)\phi}, \tag{19}$$

$$y^s(\sigma^s) = \frac{\delta(\tilde{G}^c - \tilde{G}^s)}{(1+\delta)\phi}. \tag{20}$$

In contrast to profit maximization, the subsidy and public good provision under shareholder democracy are not only a function of the median citizen's preferences represented by $\tilde{G}^c$, but also of the median shareholder's preferences represented by $\tilde{G}^s$.

4 Main Results

4.1 ESG Backlash and Irrelevance of Shareholder Democracy

How does the political system respond to shareholder democracy? To answer this question, we compare the equilibrium subsidy under shareholder democracy $\sigma^s(\tilde{G}^c)$ to the equilibrium subsidy $\sigma^p(\tilde{G}^c)$ under profit maximization.

Proposition 1 (ESG backlash)**.** *If the median shareholder is sufficiently pro-social, such that $\tilde{G}^s > \mu\tilde{G}^c$, shareholder democracy results in "ESG backlash," defined as a reduction in the equilibrium subsidy relative to the level under profit maximization*

$$\sigma^p - \sigma^s = \frac{\tilde{G}^s - \mu\tilde{G}^c}{(1+\delta)(1-\mu)}, \tag{21}$$

which increases in $\tilde{G}^s$. If the median shareholder's pro-social preferences are sufficiently strong, $\tilde{G}^s > \tilde{G}^c$, then the public good is taxed under shareholder democracy: $\sigma^s < 0$.

Proposition 1 highlights the two-way feedback between the political and corporate governance systems: the subsidy set by the political system affects shareholder voting and firms' investments in public goods, while firms' anticipated investment decisions, in turn, shape the political choices made by citizens. In particular, the political system endogenously responds to shareholders' pro-social stance by taking a less pro-social stance, resembling ESG backlash. If the median citizen perceives shareholders as excessively pro-social, public good provision may even be taxed rather than subsidized in equilibrium.

While in our model ESG backlash occurs in the form of reduced Pigouvian subsidies, in reality, it may manifest through other policy responses such as anti-ESG state-level legislation targeting public retirement plans providers or banks (Garrett and Ivanov (2024), Rajgopal et al. (2024); see Section 4.2.2 for a discussion). We capture the key essense of ESG backlash: the political system endogenously responds to shareholders' pro-social initiatives by taking a less pro-social stance.

Given the endogenous response by the political system, an important question is whether shareholder democracy has an effect on equilibrium allocations at all.

Proposition 2 (Irrelevance of Shareholder Democracy)**.** *If $\delta = 0$ and $\mu < 1$, the equilibrium firm policies (x, y) under shareholder democracy are equivalent to those under profit maximization.*

Proposition 2 follows from comparing Eq. (19) to (16), and Eq. (20) to (17). If $\delta = 0$, the effects of shareholder democracy are perfectly offset by the endogenous public policy response. In contrast, if $\delta > 0$, public policy does not fully offset shareholder democracy because citizens trade-off implementing their preferred level of public good provision against the deadweight losses induced by the policy.

Thus, with $\delta > 0$, the equilibrium public good provision under shareholder democracy is tilted towards the preference of shareholders represented by $\tilde{G}^s$, and reflects to a smaller extent the median citizen's preference $\tilde{G}^c$. This captures the representation problem of shareholder democracy and is a result of the "one share-one vote" vs. "one person-one vote" rule distinction.

While we derive the irrelevance result for a specific political process and a specific corporate governance process (majority voting at both stages), it holds more generally. To see this, consider a different governance process (e.g., shareholder engagement), which results in firm investments $x(\sigma), y(\sigma)$ given subsidy σ. Suppose $\delta = 0$, so that it is infinitely costly for the firm to divert. Then, the subsidy does not result in diversion, i.e., $\frac{\partial y(\sigma)}{\partial \sigma} = 0$ for any corporate governance process. The first-order condition (13) then implies that as long as public good investments respond to subsidies (i.e., $\frac{\partial x(\sigma)}{\partial \sigma} \neq 0$), the subsidy preferred by household i satisfies $G_i^c = \Phi'(x(\sigma))$ irrespective of the functional form of $x(\sigma)$. Thus, given majoritarian elections at the political stage, the equilibrium public good investment x^* by each firm will satisfy $\tilde{G}^c = \Phi'(x^*)$, regardless of the firm's governance process (profit maximization, shareholder voting, engagement, or others). This is the essence of the irrelevance result. The same logic extends to other decision-making processes at the political stage, as long as they aggregate the policy preferences of individual citizens who solve (12). For instance, the irrelevance also holds when enacting a policy requires support by supermajority or if the political sway of different citizen types is uneven. Moreover, this logic implies that the irrelevance result holds for general cost functions $\Phi(x)$ and $\Psi(x)$, provided that $\Psi(x)$ makes it infinitely costly for the firm to divert and $\Phi'(x^*(\sigma))$ crosses the pivotal voter's G_i^c.[19]

The requirement that public good investments respond to the subsidy, $\frac{\partial x(\sigma)}{\partial \sigma} \neq 0$, explains why the second condition for the irrelevance result in Proposition 2 is $\mu = 1$. If $\mu = 1$, shareholders are universal owners who own a share in each and every firm in the economy. Universal owners do not divert because they fully internalize the resulting deadweight loss. At the same time, they do not respond to subsidies because they fully internalize that a higher subsidy implies higher taxes (see Eq. (9)). This implies that voting in the political stage cannot undo the policies implemented by shareholders, in contrast to the case of not-perfectly-diversified shareholders. Consequently, the irrelevance result does not hold if shareholders are perfectly diversified universal owners, even if $\delta = 0$.

4.2 Costs and Benefits of Shareholder Democracy

We now evaluate welfare under profit maximization and shareholder democracy. First, we derive the welfare of a given household i and utilitarian welfare. This helps us understand who benefits from shareholder democracy and whether it makes a "typical citizen" better off. Next, we study the conditions under which first-best outcomes can be achieved.

[19] In addition, the irrelevance result relies on the assumption that a uniform Pigouvian subsidy can implement the first best (defined as the allocation that maximizes utilitarian social welfare in the absence of frictions). While this assumption effectively requires firms to be symmetric in their ownership structures, it still allows asymmetries in their production technologies, i.e. it permits $\Phi_j(x_j)$ and $\Psi_j(y_j)$. If the first best could not be implemented by a uniform public policy, shareholder democracy could have an advantage of being able to tailor public good provision to firm-specific characteristics.

4.2.1 Citizens' Welfare Under Shareholder Democracy

A typical citizen may be better or worse off under shareholder democracy compared to profit maximization. The benefit of shareholder democracy is that the equilibrium subsidy and therefore deadweight losses are smaller (Lemma 1). The cost is the representation problem: the equilibrium level of public good provision is tilted towards the median shareholder's preference. The following result specifies the conditions under which a given household is better off and compares utilitarian welfare under the two regimes.

Proposition 3 (Welfare). *Let U_i^s (W^s) and U_i^p (W^p) be household i's utility (utilitarian welfare) under shareholder democracy and profit maximization, respectively. Then*

$$U_i^s - U_i^p = \frac{\delta \tilde{G}^s}{\phi(1+\delta)}\left(G_i^c - \frac{\tilde{G}^s}{2}\right), \tag{22}$$

$$W^s - W^p = \frac{m\delta \tilde{G}^s}{\phi(1+\delta)}\left(\bar{\gamma} + \bar{g} - \frac{\tilde{G}^s}{2}\right). \tag{23}$$

Household i benefits from shareholder democracy as long as shareholders' social preferences, captured by $\tilde{G}^s$, are not too strong relative to those of the household, $\frac{\tilde{G}^s}{2} \leq G_i^c$. The reason is that shareholder democracy is more efficient in incentivizing public good provision because it reduces diversion. However, if $\tilde{G}^s$ is very large, shareholders are too pro-social from household i's point of view, and the equilibrium public good provision is too high from his perspective. As a result of this representation problem, household i is better off under profit maximization. The comparison of utilitarian welfare between the two regimes follows a similar logic: shareholder democracy increases welfare if $\frac{\tilde{G}^s}{2} \leq \bar{\gamma} + \bar{g}$, i.e., the median shareholder is not too pro-social relative to the average citizen.

Proposition 3 implies that the net benefits of shareholder democracy depend on two key characteristics of ownership distribution across firms: the extent of wealth inequality, reflected in the heterogeneity of households' ownership stakes ω_i, and the level of investor diversification μ. We discuss the role of each characteristic next.

The role of wealth inequality. To understand the effects of wealth inequality, we discuss several different scenarios. For simplicity, in all these scenarios, we assume that there is no heterogeneity in warm-glow utility across households: $g_i = g$ for all i.[20]

First, suppose that households also have the same utility from the public good: $\gamma_i = \gamma$ for all i. As we show in the Appendix, in this scenario, both utilitarian welfare and the median citizen's welfare are always higher under shareholder democracy, regardless of wealth distribution. Intuitively, households then have similar preferences regarding public good provision, so the representation problem is limited.[21]

In contrast, suppose that wealthier households have a higher utility from the public good: γ_i is higher for households with higher ω_i. The reason could be that wealthier individuals have more assets whose value is exposed to the public good, or that they can afford to care relatively more about social issues, making social responsibility a "luxury good" (Andersen et al., 2024; Bansal et al., 2022; Döttling and Kim, 2024). In this scenario, the median shareholder, who tends to be among the wealthy, is likely to be excessively pro-social from a typical citizen's perspective.

To see this, consider the following example. Denote by $\omega_{(k)}$ the wealth of households of type k (i.e., $\omega_i = \omega_{(k)}$ for all $i : k(i) = k$), and recall that $\omega_{(k)}$ is also the share of each firm collectively owned by households of type k. Suppose household types are ordered by wealth: $\omega_{(1)} < ... < \omega_{(K)}$, and $\sum_{k=\hat{k}}^{K} \omega_{(k)} > \frac{1}{2}$, where $\hat{k} > \frac{K}{2}$. In other words, less than half of the citizens (those with types $k \geq \hat{k}$) collectively own more than a majority of the shares in each firm, reflecting wealth inequality. Suppose also that the more wealthy citizens, whose type is $k \geq \hat{k}$, have utility benefit of the public good γ_H, whereas the less wealthy citizens, whose type is $k < \hat{k}$, have utility benefit $\gamma_L < \gamma_H$. In the Appendix, we show that if $\frac{\gamma_H}{\gamma_L}$ is large enough, then the median shareholder has utility benefit γ_H, whereas the median citizen—who has utility benefit γ_L and is less pro-social than the median shareholder—is worse off under shareholder democracy. For example, if $g_i = 0$ for all i, then shareholder democracy makes the median citizen worse off if $\frac{\gamma_H}{\gamma_L} > \frac{2}{\mu} \frac{\tilde{\omega}^s}{\tilde{\omega}^c}$.

[20] Note that utilitarian welfare depends on the weighted average warm glow $\bar{g} = \sum_{i=1}^{n} g_i \alpha_{ij}$: wealthier households hold larger ownership stakes and thus receive higher warm-glow utility. As a result, utilitarian welfare tends to favor shareholder democracy over profit maximization: it both saves on deadweight costs and leads to policies that better align with the weighted average warm-glow. Assuming homogeneous g_i allows us to focus on conclusions that are independent of the impact of warm glow utility on welfare.

[21] The representation problem is not completely eliminated because a household's pro-socialness depends on his wealth ω_i, which differs across household types. However, as we explain below, the extent of this force is limited.

Effectively, wealth inequality, combined with heterogeneity in the degree of pro-socialness, creates a strong representation problem.

Interestingly, wealth inequality also has a second effect, which acts in the opposite direction and limits the representation problem. If the median shareholder is richer and has a larger weight in the ownership structure, the term $\tilde{G}^s$ in Eq. (22) in Eq. becomes smaller. Intuitively, shareholders with larger ownership stakes are effectively less pro-social because they internalize a greater portion of the costs of public good provision (see footnote 16). In the example above, the median citizen is better off under shareholder democracy than under profit maximization if the median shareholder's wealth is sufficiently large relative to that of the median citizen's, $\frac{\tilde{\omega}^s}{\tilde{\omega}^c} > \frac{\mu}{2}\frac{\gamma_H}{\gamma_L}$ (see the Appendix), i.e., if wealth inequality is high enough. Therefore, while wealth inequality creates the representation problem to begin with, high wealth inequality can also limit the representation problem by reducing the effective pro-socialness of the median shareholder.

The role of diversification. The second characteristic of firms' ownership structures that influences the net benefits of shareholder democracy is the degree of investor diversification. Recall that as shareholders become more diversified, their effective pro-socialness $\tilde{G}^s$ increases, whereas citizens' pro-socialness $\tilde{G}^c$ remains unchanged. This implies that diversification may exacerbate the representation problem of shareholder democracy.

Denoting by $\widetilde{G}^s(\mu)$ the pro-socialness of the median shareholder for a given level of diversification μ, we obtain the following result.

Proposition 4 (Effect of Diversification)**.** *An increase in diversification from μ to $\mu' > \mu$:*

- *increases the effective pro-socialness of the median shareholder: $\widetilde{G}^s(\mu') > \widetilde{G}^s(\mu)$;*
- *increases household i's utility under shareholder democracy if and only if $G_i^c > \frac{1}{2}\left[\widetilde{G}^s(\mu) + \widetilde{G}^s(\mu')\right]$;*
- *increases "ESG backlash" defined by (21) if the median citizen is hurt by shareholder democracy, $\tilde{G}^c < \frac{\tilde{G}^s(\mu)}{2}$.*

This result presents a nuanced view of how investor diversification affects welfare. On the one hand, diversification leads to greater public good provision and a lower deadweight loss because diversified shareholders are effectively more pro-social. On the other hand, diversification can exacerbate the representation problem of shareholder democracy. In particular, Proposition 4 implies that if the equilibrium level of public good provision is already excessive from a typical citizen's perspective, this citizen becomes even more worse off when diversification increases.[22] The political system then endogenously responds by implementing deeper subsidy cuts. Thus, greater investor diversification can intensify the ESG backlash. This conclusion is consistent with the rise of index investing preceding the growth of ESG backlash as a political phenomenon, and with index funds often being the targets of anti-ESG bills (see footnote 6 and Section 4.2.2).

Negative warm glow. We have so far assumed that warm glow utility g_i is non-negative. Given the increased polarization and politicization of corporate social responsibility, some individuals may oppose environmentally-friendly investments (i.e., have $g_i < 0$), despite benefiting from reduced pollution ($\gamma_i > 0$). Our analysis remains unchanged for any values of g_i, including negative ones. With negative warm glow, and especially if shareholders are undiversified, the median shareholder's effective pro-socialness may turn negative as well, $\tilde{G}^s < 0$. In such cases, shareholder democracy makes it harder to incentivize public good provision and increases diversion compared to profit maximization (Eqs. (9)–(10) and (16)–(17)). Proposition 3 then implies that shareholder democracy decreases welfare (we assume that $\bar{\gamma} + \bar{g} > 0$ even if some g_i are negative). In our paper, we focus on the empirically more relevant case where $\tilde{G}^s > 0$.

4.2.2 First Best and the Role of Universal Owners

We now ask whether the equilibrium can implement the first best, i.e, the outcomes preferred by the utilitarian social planner, as derived in Section 2.1: $x^{FB} = \frac{\bar{\gamma}+\bar{g}}{\phi}, y^{FB} = 0$.

To simplify the formulation of these results, we introduce the notation $G^{SP} \equiv \bar{\gamma} + \bar{g}$, which is the average marginal social benefit of the public good. We will say that citizen

[22]This immediately follows from Propositions 3 and 4: if household i is worse off under shareholder democracy, i.e., if $\widetilde{G}^s(\mu) > 2G_i^c$ so that (22) is negative, then it must be that $\widetilde{G}^s(\mu) > G_i^c$, and hence $\frac{1}{2}[\widetilde{G}^s(\mu) + \widetilde{G}^s(\mu)] > G_i^c$ as well.

(shareholder) i is "aligned" with the planner if $G_i^c = G^{SP}$ ($G_i^s = G^{SP}$), which ensures that i values the marginal benefit of public good provision as the planner. The following result summarizes the conditions under which the first-best can be achieved.

Lemma 2 (First Best)**.**

1. Under profit maximization, the first best can be attained only if $\delta = 0$. If $\delta = 0$, it is attained if the median citizen is aligned with the social planner ($\tilde{G}^c = G^{SP}$).

2. Under shareholder democracy, the first best is attained:

(i) if $\delta = 0$, $\mu < 1$, and the median citizen is aligned with the social planner ($\tilde{G}^c = G^{SP}$)

(ii) or for any δ if the median shareholder is aligned with the social planner ($\tilde{G}^s = G^{SP}$) and either $\mu = 1$ or $\tilde{G}^c = \tilde{G}^s$.

Under profit maximization, firms do not invest in the public good unless they are incentivized by the subsidy, but the subsidy, in turn, triggers diversion whenever $\delta > 0$. Hence, the first-best allocation can only be achieved if $\delta = 0$.

Shareholder democracy can achieve the first-best if $\delta = 0$ as well: given the irrelevance result, if $\delta = 0$ and $\mu < 1$, the political system fully offsets any effects of shareholder voting, and the condition for attaining the first-best is the same as under profit maximization – the median citizen needs to be aligned with the social planner. In this case, both systems achieve the first-best, but with different subsidies: $\sigma^p = \bar{\gamma} + \bar{g}$ under profit maximization, and $\sigma^s = \frac{1}{1-\mu}[\bar{\gamma} + \bar{g} - \tilde{G}^s]$ under shareholder democracy. In addition, since shareholders are pro-social, shareholder democracy can achieve first-best even when $\delta > 0$: if the median shareholder is aligned with the social planner, his pro-social preferences represented by $\tilde{G}^s$ induce him to vote for the first-best level of public good provision. To ensure that the subsidy does not induce the shareholder to divert, two conditions are sufficient: either shareholders are perfectly diversified ($\mu = 1$), so that they fully internalize the deadweight loss from diversion and do not react to the subsidy; or the median citizen is aligned with the median shareholder ($\tilde{G}^s = \tilde{G}^c$) and thus sets a subsidy of zero, realizing that shareholder democracy will implement his preferred policies.

This result highlights the potential benefit of perfectly diversified universal owners: if they represent the average citizen ($\tilde{G}^s = G^{SP}$), their involvement in corporate governance can help achieve efficiency. However, there are potential downsides as well: if universal owners do not represent the average citizen and thus induce suboptimal public good provision, this inefficiency cannot be corrected by the subsidy ($\frac{\partial x(\sigma)}{\partial \sigma} = 0$ if $\mu = 1$). In that case, other types of interventions (e.g., quantity-based regulations or restrictions on universal owners' size and voting power) may be needed to correct the inefficiencies. In practice, ESG backlash against large diversified asset managers has indeed manifested itself through other types of interventions: politicians have proposed restricting index funds' voting power and have withdrawn state funds' assets from certain fund managers.[23]

When does a universal owner represent the average citizen? This happens if (i) their benefits from the public good match the average, $\tilde{\gamma}^s = \bar{\gamma}$ and $\tilde{g}^s = \bar{g}$, and (ii) they hold a proportional share, $\tilde{\omega}^s = \frac{1}{K}$. The second condition is important due to the impact of wealth on shareholders' pro-socialness discussed earlier. For example, if $\tilde{\omega}^s > \frac{1}{K}$, the universal owner has a large stake in firms in the economy, and through that ownership pays for public good provision more than proportionally. As a result, they prefer a lower level of public good provision compared to the planner. Hence, under significant wealth inequality, universal owners are less likely to accurately represent the average citizen.

5 Extensions

Our framework is tractable and flexible to allow studying various extensions relevant in the context of political and corporate democracy. Section 5.1 introduces an extension in which shares are held and voted through funds, and Section 5.2 studies lobbying.

5.1 Ownership through Funds and Pass-Through Voting

Until now, we have abstracted from the delegated nature of shareholder voting and assumed that shareholders cast their votes directly. In reality, most households hold shares through fund managers and, by default, delegate their voting rights to them. Fund man-

[23]For proposals restricting index funds' voting power see the 2023 House Committee on Financial Services bill and the 2022 INDEX Act. For an example of state funds' withdrawals, see "Texas schools fund pulls $8.5 billion from BlackRock over ESG investing," Reuters, March 19, 2024.

agers typically vote all the shares they manage as a single block and may not necessarily do so in a way that maximizes the interests of fund investors. Recently, due to disagreements over E&S issues, this system has come under pressure, generating a push towards "pass-through voting." Under pass-through voting, shares are voted in line with fund investors' preferences, rather than those of the fund manager. While there are different ways to implement pass-though voting (e.g., Blackrock, 2022; Malenko and Malenko, 2024), one proposed system involves the fund surveying investors about their preferences and voting each share in line with the underlying investor's preference (Fisch and Schwartz, 2023). Our baseline model is equivalent to such a system. In this section, we compare this pass-through voting system with the traditional system of vote delegation.

In particular, instead of assuming that each shareholder votes directly (as in the pass-through voting system), suppose that in each firm, shareholders with ownership stakes α_{ij} below some threshold $\hat{\alpha}$ do not vote directly, but instead invest through a fund, which votes all shares as a block, according to a single policy. We assume that the fund manager maximizes a weighted average of her own and fund investors' preferences, and may put a higher weight on wealthier investors' preferences:

$$\max_{x_j, y_j} \; \nu U^{FM} + (1-\nu) U^{FI},$$

where U^{FM} is the fund manager's utility and U^{FI} is the weighted average of fund investors' utilities with weights ζ_i:

$$U^{FI} = \sum_{i \in fund} \zeta_i U_i = \sum_{i \in fund} \left\{ \sum_{j=1}^{m} \frac{\zeta_i \gamma_i}{n} x_j - \zeta_i \tau_i T + \sum_{j=1}^{m} \left[\Pi(x_j, y_j) + g_i x_j \right] \zeta_i \alpha_{ij} \right\}.$$

Using general weights ζ_i allows us to consider both equal weights $\zeta_i = 1/n_{FI}$, where n_{FI} is the number of fund investors, and wealth-dependent weights, ζ_i proportional to $\bar{\alpha}_i$.

We assume that the fund manager's utility is given by

$$U^{FM} = \sum_{j=1}^{m} g^{FM} x_j \tag{24}$$

where g^{FM} is the fund manager's warm-glow utility from managing the fund in line with her moral convictions. As we show in Online Appendix B.1, the level of x_j preferred by the fund manager is

$$x^{fund}(\sigma, \bar{G}^{FI}, g^{FM}) = \frac{\bar{G}^{FI} + \sigma(1-\mu)}{\phi} + \frac{\nu g^{FM}}{\phi(1-\nu)\bar{\alpha}_j^{FI}}, \tag{25}$$

while the preferred y_j is the same as in the baseline model and given by Eq. (10), and where we defined, analogous to shareholders' G_i^s in Eq. (11),

$$\bar{G}^{FI} \equiv \mu \frac{\bar{\gamma}^{FI}}{K\bar{\omega}^{FI}} + \bar{g}^{FI}, \tag{26}$$

where $\bar{\gamma}^{FI} \equiv \sum_{i \in fund} \zeta_i \gamma_i$, $\bar{\omega}^{FI} \equiv \sum_{i \in fund} \zeta_i \omega_i$, and $\bar{\alpha}_j^{FI} \equiv \sum_{i \in fund} \zeta_i \alpha_{ij}$ denote the weighted average γ_i, ω_i, and α_{ij} among fund investors (weighted by ζ_i), and $\bar{g}^{FI} \equiv \frac{\sum_{i \in fund} \zeta_i g_i \omega_i}{\sum_{i \in fund} \omega_i}$ is the weighted average g_i among fund investors (weighted by ζ_i and ω_i).

The fund's preferred $x^{fund}(\sigma, \bar{G}^{FI}, g^{FM})$ consists of two components. The first term is analogous to shareholders' $x^s(\sigma, G_i^s)$, with $\bar{G}^{FI}$ taking the place of G_i^s. The second term reflects the fund manager's own preferences represented by g^{FM}. This term drops out if $\nu = 0$, i.e., if the fund manager disregards her own preferences and simply maximizes the weighted average utility of fund investors.

Case $\nu = 0$. Even with $\nu = 0$, the presence of the fund can change equilibrium outcomes. If the fund is the median shareholder, firms will implement a level of public good investments equal to $x^s(\sigma, \bar{G}^{FI})$ and $y^s(\sigma)$. Therefore, the outcome of the first-stage political elections is the one derived in Section 3.2.2, but with $\bar{G}^{FI}$ replacing shareholders' weighted-median $\tilde{G}^s$. This implies that the presence of the fund can result in a higher level of public good investment and higher ESG backlash than under pass-through voting if and only if $\bar{G}^{FI} \geq \tilde{G}^s$. Moreover, Proposition 3 implies that in this case, citizen i may be better off under shareholder democracy if shares are voted directly, but better off under profit maximization if shares are voted by the fund.

To evaluate under what circumstances $\bar{G}^{FI} \geq \tilde{G}^s$, suppose there is no heterogeneity in the utility parameters γ_i and g_i. Then, $\bar{G}^{FI} \geq \tilde{G}^s$ if and only if $\bar{\omega}^{FI} \leq \tilde{\omega}^s$, consistent with our assumption that investors below a threshold $\hat{\alpha}$, i.e., the less wealthy households, invest through the fund and do not directly vote their shares. $\bar{G}^{FI}$ is large in this case because, as discussed earlier, less wealthy investors are effectively more pro-social, as they internalize a smaller portion of the costs of public good provision.

Case $\nu > 0$. With $\nu > 0$, the fund manager's preference also affects outcomes. As we show in Online Appendix B.1, the level of public good provision under shareholder democracy exceeds that under profit maximization by

$$x^{fund} - x^p = \frac{\delta \left(\bar{G}^{FI} + \frac{\nu g^{FM}}{(1-\nu)\bar{\alpha}_j^{FI}} \right)}{\phi(1+\delta)}, \tag{27}$$

which increases in the fund manager's warm glow g^{FM}. In contrast, in the baseline model, i.e., under the pass-through voting system, the difference is

$$x^s - x^p = \frac{\delta \tilde{G}^s}{\phi(1+\delta)}. \tag{28}$$

Comparing (27) and (28), we see that delegated voting can exacerbate the representation problem of shareholder democracy due to two effects. First, $\bar{G}^{FI}$ can be larger than $\tilde{G}^s$, as discussed in the case $\nu = 0$. Second, the fund manager's pro-social preference g^{FM} can directly increase the level of public good provision, shifting it even further away from the level preferred by a typical citizen. In this scenario, a move from profit maximization to shareholder democracy should be accompanied by the introduction of a pass-through voting system, in order to limit the representation problem.

5.2 Lobbying

The interplay between politics and business, which is the core focus of our paper, naturally gives rise to the possibility of lobbying, where corporations use their resources to influence politicians and tilt public policies in their favor. Lobbying efforts may either aim to alter the overall policy or to seek special treatment after the baseline policy stance is set.

If lobbying aims to change the overall policy (i.e., in the context of our model, the subsidy faced by all firms), it can allow wealthier individuals to have their preferences more represented at the political stage. This would limit the political system's ability to shift the level of public good provision toward the median citizen's preference and imply that there is a representation problem even under profit maximization.[24]

To explore lobbying that seeks special treatment by politicians, we consider the following extension of the baseline model.

After the political system determines subsidy σ, but before firms make investment decisions (x_j, y_j), each firm j can lobby the government and increase the subsidy, to firm j only, from σ to $\sigma + l_j$. The cost of lobbying to the firm is $\Lambda(l) = \frac{\lambda}{2} l^2$, and we assume

$$\lambda > \frac{1+\delta}{\phi}. \tag{29}$$

to ensure a finite lobbying effort in equilibrium. The cost of lobbying captures direct payments to lobbying consultants, political donations, or the time spent by senior management on engagement with legislators and bureaucrats. Similar to its investment policy, the firm decides on the lobbying intensity based on the mandate it has.

Lobbying under profit-maximization. Given subsidy σ and lobbying l, a profit-maximizing firm chooses $x^p(\sigma + l)$ and $y^p(\sigma + l)$, where $x^p(\cdot)$ and $y^p(\cdot)$ are given by (4) and (5), respectively. Firms receive larger subsidies due to their lobbying effort and thus invest more in the public good, but also engage in more diversion. The firm's profit is

$$\Pi(\sigma, l) = \pi + \frac{(\sigma + l)^2}{2} \frac{1+\delta}{\phi} - \lambda \frac{l^2}{2}.$$

[24]In our model, we can capture this in a reduced-form way as follows. Suppose households have heterogeneous political influence, so that their effective voting power in political elections is not one-person-one-vote, but rather increases with wealth, similar to shareholder democracy. Then, the equilibrium outcome would be as derived in Section 3.2, but with $\tilde{G}^c$ representing a weighted median rather than a simple median. This shifts the political outcome towards the preference of the wealthy.

Anticipating the effect of lobbying on its own choice of public good investment and diversion, the firm chooses lobbying intensity that maximizes $\Pi(\sigma, l)$:

$$l^p(\sigma) = \frac{1+\delta}{\lambda\phi - 1 - \delta}\sigma. \tag{30}$$

Notice that the incentives to lobby, captured by $l^p(\sigma)$, increase in σ. Intuitively, a larger σ implies larger investments in the public good, and such larger investments increase the marginal profitability of additional subsidies. Thus, profit maximizing firms are expected to lobby more intensively under aggressive government intervention.

Under the optimal lobbying policy $l^p(\sigma)$, the firm's investment in the public good and diversion are $x^p(\sigma + l^p(\sigma)) = \frac{\sigma}{\phi - \frac{1+\delta}{\lambda}}$ and $y^p(\sigma + l^p(\sigma)) = \delta\frac{\sigma}{\phi - \frac{1+\delta}{\lambda}}$, respectively. These terms are identical to those in the baseline model, with the exception that ϕ is replaced by $\phi - \frac{1+\delta}{\lambda}$. That is, lobbying has the same effect as reducing the firm's marginal cost of investment in the public good.

When voting on the subsidy at the political stage, citizens anticipate how it will affect future lobbying activity. Lemma 3 in the Online Appendix shows that the equilibrium subsidy under profit-maximization is given by

$$\sigma^p = \frac{\widetilde{G}^c}{1+\delta} - \frac{2\widetilde{G}^c}{\phi\lambda + 1 + \delta}, \tag{31}$$

which increases in λ, the cost of lobbying. Intuitively, since firms have stronger incentives to lobby when subsidies are larger, households mitigate the anticipated impact of lobbying by cutting subsidies up-front. In this respect, lobbying triggers a response similar to a backlash in political elections. Note also that while in the absence of lobbying, the Pigouvian subsidy does not depend on the cost of public good investment (see Eq. (15)), this is no longer true with lobbying: the subsidy is increasing in ϕ. Intuitively, since expected lobbying $l^p(\sigma)$ decreases with ϕ, households can cut subsidies to a lesser extent when the costs of public good provision are high.

Lemma 3 also shows that the possibility of lobbying reduces firms' profits and the median citizen's welfare. Intuitively, citizens' response to the prospect of lobbying ultimately leaves firms with lower subsides than what they would have had if lobbying was prohibited, and therefore, with lower profits. Median citizen's welfare is harmed by lobbying because of its deadweight costs and the reduction in firms' profits.[25]

Lobbying under shareholder democracy. Under shareholder democracy, firms pick investment, diversion, and lobbying levels preferred by the median shareholder.[26] In particular, Lemma 4 in the Online Appendix shows that the firm chooses lobbying intensity

$$l^s(\sigma) = (1-\mu)\frac{\widetilde{G}^s + \sigma(1+\delta)(1-\mu)}{\phi\lambda - (1+\delta)(1-\mu)^2}, \tag{32}$$

and investment and diversion levels $x^s(\sigma + l^s(\sigma), \widetilde{G}^s)$ and $y^s(\sigma + l^s(\sigma))$, where $x^s(\cdot, \widetilde{G}^s)$ and $y^s(\cdot)$ are given by (9) and (10), respectively. Similar to $l^p(\sigma)$, lobbying activity $l^s(\sigma)$ increases with σ. Unlike $l^p(\sigma)$, it also increases with the pro-socialness of shareholders, $\widetilde{G}^s$: lobbying implies a larger subsidy and investment in the public good, which is valued more by shareholders with stronger pro-social preferences. In addition, holding shareholders' pro-socialness constant,[27] lobbying activity decreases with shareholder diversification μ and completely vanishes under perfect diversification. Intuitively, more diversified shareholders hold smaller stakes in a larger number of firms, and hence, benefit less from the lobbying of each firm and better internalize the increased tax burden.

Lemma 4 also shows that the equilibrium subsidy under shareholder democracy is

$$\sigma^s = \frac{\widetilde{G}^c - \widetilde{G}^s}{(1+\delta)(1-\mu)} - \frac{2(1-\mu)\widetilde{G}^c}{\lambda\phi + (1+\delta)(1-\mu)^2}. \tag{33}$$

Similarly to σ^p, the subsidy σ^s is increasing in λ. Moreover, Lemma 4 also shows that, similarly to the profit-maximizing regime, the possibility of lobbying reduces firms' profits and the median citizen's welfare.

[25]Corporate lobbying in our model does not present any benefits, such as providing legislators with information or tailoring the public policy to the firm's specific characteristics (indeed, firms are symmetric in our model).

[26]Formally, we assume that the firm first picks its lobbying intensity. Then, once the subsidy $\sigma + l_j$ is set, the firm picks x_j and y_j. Thus, the median voter theorem applies at each of these two stages.

[27]Recall that $\widetilde{G}^s$ increases with μ, which is an effect we shut down by keeping $\widetilde{G}^s$ constant.

Comparison between the two regimes. We now compare the effects of lobbying between the two governance regimes. As we show in the Online Appendix, the irrelevance result no longer holds with lobbying: the equilibrium public good provision under shareholder democracy differs from that under profit maximization even if diversion is prohibitively costly ($\delta = 0$). Intuitively, lobbying involves a deadweight loss that cannot be remedied by households' political activities.

The following result compares equilibrium outcomes under the two regimes.

Proposition 5 (Lobbying)**.**

1. The equilibrium lobbying activity is lower under shareholder democracy than under profit maximization.

2. ESG backlash, defined by (21)*, is smaller with lobbying.*

3. The difference between the median citizen's welfare under shareholder democracy and that under profit maximization is higher with lobbying.

Proposition 5 shows that more lobbying is expected under profit maximization. Intuitively, shareholders internalize the effect of lobbying on the tax burden when expressing their preferences in a shareholder democracy, and hence support lower lobbying efforts than the one chosen by a profit-maximizing firm. Thus, shareholder democracy can partially safeguard against the adverse effects of corporate lobbying. Part 2 shows that lobbying reduces the extent of ESG backlash. Intuitively, since higher lobbying is expected under profit maximization, citizens support deeper cuts in the subsidy under profit maximization than under shareholder democracy to mitigate the negative effects of lobbying, effectively shrinking ESG backlash. Part 3 establishes that a typical citizen's net benefit from shareholder democracy relative to profit maximization is higher (i.e., more positive or less negative) when corporations engage in lobbying. This is because, according to part 1, lobbying creates larger distortions under profit maximization.

6 Conclusion

This paper studies the two-way interaction between political and shareholder democracy in the provision of public goods. When shareholder pressure prompts firms to consider broader societal interests alongside profit maximization, the political system responds as well. The resulting ESG backlash reduces the effects of shareholder democracy and may undo or tax corporate social responsibility measures. In fact, in the absence of frictions in public policy provision, the political system fully offsets any ramifications of shareholder influence, and shareholder democracy becomes irrelevant.

With public policy imperfections, the costs and benefits of shareholder democracy crucially depend on the distribution of ownership across firms. While shareholder democracy can bolster public goods provision and reduce the social costs of public policy, it may also prioritize the preferences of the wealthy due to the "one share-one vote" system, contrasting with the "one person-one vote" principle of political democracy. The preference representation problem can be exacerbated by greater investor diversification and the rise of universal owners: Diversified shareholders prompt firms to increase their provision of public goods, but in the presence of wealth inequality, this could potentially disadvantage the typical citizen and amplify the ESG backlash. Implementing pass-through voting alongside shareholder democracy may partly mitigate this issue, ensuring broader representation of citizens' interests.

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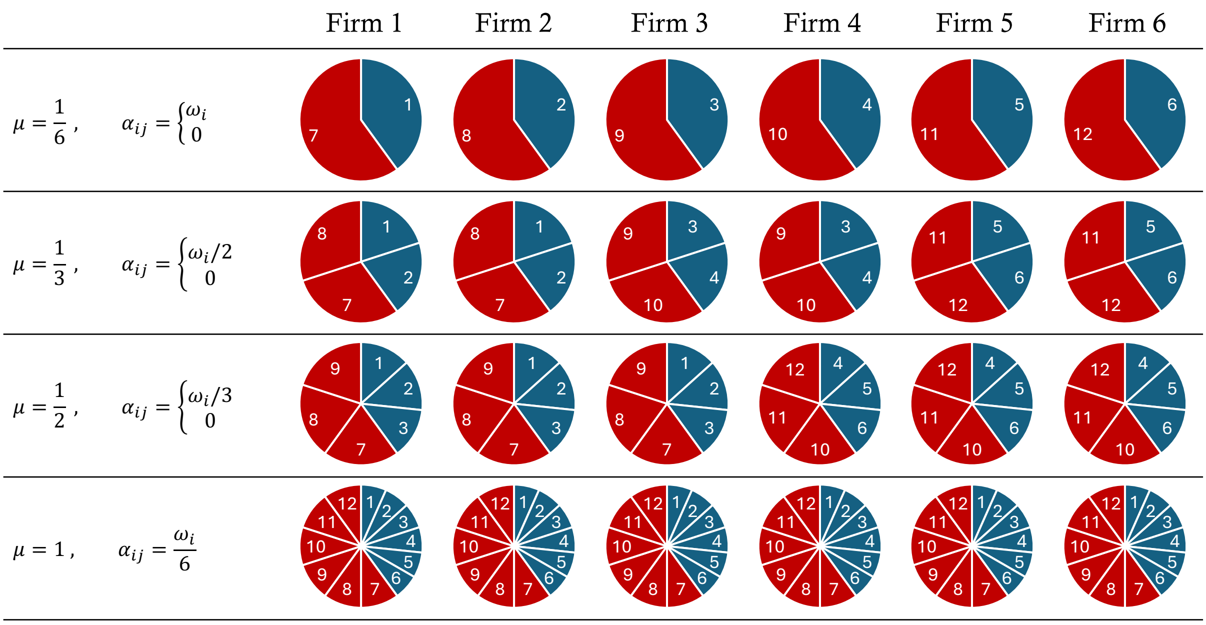
Figure 1. Illustration of Ownership Structure

This figure illustrates how our setup captures different ownership structures using an example with $m = 6$ firms and $K = 2$ types of households, B(lue) and R(ed), with $\omega_i = 0.4$ for blue types and $\omega_i = 0.6$ for red types. There are $n = mK = 12$ households, of which $i \in \{1, ..., 6\}$ are of type B, and $i \in \{7, ..., 12\}$ of type R. The figure illustrates how ownership shares are allocated for the four possible values that μ can take in this case. The first row describes the case $\mu = 1/6$, such that households are fully undiversified. The second and third rows illustrate the cases $\mu = 1/3$ and $\mu = 1/2$ respectively. The last row illustrates the case $\mu = 1$, in which shareholders are perfectly diversified. The pie charts plot the individual ownership shares α_{ij} of each household i in firm j. The numbers in the pie chart are the index i of the respective household. The color represents the household's type.



A Derivations and Proofs

We start by showing that the combined stake of household i in all firms, ω_i, also equals the share of each firm that is collectively owned by households of the same type as i. To see this, note that the combined ownership stake of all households of type k in firm j is

$$\sum_{i=1}^{n} \mathbf{1}_{k(i)=k}\alpha_{ij} = \frac{1}{m}\sum_{j=1}^{m}\sum_{i=1}^{n} \mathbf{1}_{k(i)=k}\alpha_{ij} = \frac{1}{m}\sum_{i=1}^{n} 1_{k(i)=k}\sum_{j=1}^{m}\alpha_{ij} = \frac{1}{m}\sum_{i=1}^{n} 1_{k(i)=k}\omega_i,$$

where the first equality follows from the fact that types are equally distributed across firms, the second follows from switching the summation order, and the third follows from the definition of ω_i. Because, among n households, there are m households of type k, $\sum_{i=1}^{n} 1_{k(i)=k}\omega_i = m\omega_{(k)}$, and hence $\sum_{i=1}^{n} \alpha_{ij}\mathbf{1}_{k(i)=k} = \omega_{(k)}$. Thus, for any household i, the combined ownership stake of all households of type $k(i)$ in firm j is ω_i, as required.

This is illustrated in the example in Figure 1. In each row, the ownership shares across firms of a given blue household (e.g., $i = 1$) sum to $\sum_{j=1}^{m} \alpha_{ij} = \omega_i = 0.4$. At the same type, within a given firm, the ownership shares of all blue types also sum to $\sum_{i:k(i)=B} \alpha_{ij} = \omega_i = 0.4$.

A.1 Proof of Lemma 1

From Eq. (4), implementing a given level $\hat{x}$ requires a subsidy $\sigma^p = \phi\hat{x}$, which results in diversion $y^p(\sigma^p) = \delta\hat{x}$ under profit maximization. Under shareholder democracy, from Eq. (9), implementing $\hat{x}$ requires a subsidy

$$\sigma^s = \frac{\phi\hat{x} - \left(\mu\frac{\tilde{\gamma}^s}{K\tilde{\omega}^s} + \tilde{g}^s\right)}{1-\mu}.$$

This implies

$$y^s(\sigma^s) = \delta\hat{x} - \delta\frac{\left(\mu\frac{\tilde{\gamma}^s}{K\tilde{\omega}^s} + \tilde{g}^s\right)}{\phi}.$$

Taking the difference between $y^p(\sigma^p)$ and $y^s(\sigma^s)$ yields the condition in Lemma 1.

A.2 Political Stage

Use that $x_j = x^*(\sigma)$ and $y_j = y^*(\sigma)$ for all j, so that $X = mx^*(\sigma)$ and $T = m\sigma(x^*(\sigma) + y^*(\sigma))$, where $x^*(\sigma)$ denotes the equilibrium level implemented in the first stage. Also use that we focus on $\tau_i = \bar{\alpha}_i = \omega_i/m$, and that $\alpha_{ij} = \omega_i/m\mu$ for the $m\mu$ firms a household owns and $\alpha_{ij} = 0$ otherwise, to write the problem (12) as

$$\begin{aligned}
U_i &= \frac{\gamma_i}{n} X - \tau_i T + \sum_{j=1}^{m} \left[\Pi(x_j, y_j) + g_i x_j \right] \alpha_{ij} \\
&= \frac{\gamma_i}{n} m x^*(\sigma) - \omega_i \sigma (x^*(\sigma) + y^*(\sigma)) \\
&\quad + \left[\pi + g_i x^*(\sigma) + \sigma(x^*(\sigma) + y^*(\sigma)) - \Psi(y^*(\sigma)) - \Phi(x^*(\sigma)) \right] \omega_i \\
&= \frac{\gamma_i}{K} x^*(\sigma) + \left[\pi + g_i x^*(\sigma) - \Psi(y^*(\sigma)) - \Phi(x^*(\sigma)) \right] \omega_i \qquad (34)
\end{aligned}$$

FOC with respect to σ:

$$\frac{\gamma_i}{K} \frac{\partial x^*(\sigma)}{\partial \sigma} + \left[g_i \frac{\partial x^*(\sigma)}{\partial \sigma} - \Psi'(y^*(\sigma)) \frac{\partial y^*(\sigma)}{\partial \sigma} - \Phi'(x^*(\sigma)) \frac{\partial x^*(\sigma)}{\partial \sigma} \right] \omega_i = 0$$

Collecting terms yields (13) in the main text:

$$\left[\frac{\gamma_i}{K\omega_i} + g_i - \Phi'(x^*(\sigma)) \right] \frac{\partial x^*(\sigma)}{\partial \sigma} - \Psi'(y^*(\sigma)) \frac{\partial y^*(\sigma)}{\partial \sigma} = 0 \qquad (35)$$

We can now use the different $x^*(\sigma)$ and $y^*(\sigma)$ under profit maximization and shareholder democracy.

A.2.1 Profit Maximization

Under profit maximization, $x^p(\sigma) = \frac{\sigma}{\phi}$ and $y^p(\sigma) = \frac{\delta\sigma}{\phi}$, see Eqs. (4) and (5). Thus, the general FOC (13) becomes

$$\left[\frac{\gamma_i}{K\omega_i} + g_i - \sigma \right] \frac{1}{\phi} - \frac{\delta\sigma}{\phi} = 0. \qquad (36)$$

Re-arranging yields Eq. (15) in the main text.

A.2.2 Shareholder Democracy

Under shareholder democracy,

$$x^s(\sigma, \tilde{G}^s) = \frac{\tilde{G}^s + \sigma[1-\mu]}{\phi}, \quad y^s(\sigma) = \frac{\delta\sigma[1-\mu]}{\phi}.$$

Thus, the FOC (13) becomes:

$$\left[\frac{\gamma_i}{K\omega_i} + g_i - \tilde{G}^s - \sigma[1-\mu] \right] \frac{[1-\mu]}{\phi} - \frac{\delta\sigma[1-\mu]^2}{\phi} = 0 \qquad (37)$$

Re-arranging yields Eq. (18) in the main text.

A.2.3 Single-peaked Preferences

Notice that the left-hand side of (36) monotonically increases in G_i^c and decreases in σ. The same is true in (37) if $\mu < 1$ (if $\mu = 1$, the expression is independent of σ). This implies that citizen's preferences are single-peaked under profit maximization for all μ, and under shareholder democracy if $\mu < 1$.

A.3 Proofs or Propositions 1 and 2

A.3.1 Proof of Proposition 1

Comparing (15) and (18) yields the condition for $\sigma^p > \sigma^s$ in Proposition 1. The second condition follows from evaluating when $\sigma^s < 0$.

A.3.2 Proof of Proposition 2

Proposition 2 follows from comparing Eq. (19) to (16), and Eq. (20) to (17).

A.4 Proof of Proposition 3

Since firms are symmetric, all firms choose the same investments (x, y) under both mandates. Household $i's$ utility is

$$\begin{aligned} U_i &= \frac{\gamma_i}{n} m x^* + m\mu \left[\pi + g_i x^* + \sigma\left(x^* + y^*\right) - \frac{\phi\left(x^*\right)^2}{2} - \frac{\phi\left(y^*\right)^2}{2\delta}\right] \frac{\omega_i}{m\mu} - \frac{\omega_i}{m}\sigma\left(x^* + y^*\right) m \\ &= \frac{\gamma_i}{K} x^* + \left[\pi + g_i x^* - \frac{\phi\left(x^*\right)^2}{2} - \frac{\phi\left(y^*\right)^2}{2\delta}\right]\omega_i, \end{aligned}$$

where we used $n = mK$. Under shareholder democracy, we have $(x^*, y^*) = (x^s, y^s)$ and under profit maximization, we have $(x^*, y^*) = (x^p, y^p)$. Therefore,

$$\begin{aligned} U_i^s &> U_i^p \Leftrightarrow \\ \frac{\gamma_i}{K} x^s + \left[\pi + g_i x^s - \frac{\phi\left(x^s\right)^2}{2} - \frac{\phi\left(y^s\right)^2}{2\delta}\right]\omega_i &> \frac{\gamma_i}{K} x^p + \left[\pi + g_i x^p - \frac{\phi\left(x^p\right)^2}{2} - \frac{\phi\left(y^p\right)^2}{2\delta}\right]\omega_i \Leftrightarrow \\ \frac{\phi}{2\delta}\left(y^p - y^s\right)\left(y^p + y^s\right) &> \left(\frac{\gamma_i}{K\omega_i} + g_i\right)\left(x^p - x^s\right) - \frac{\phi}{2}\left(x^p - x^s\right)\left(x^s + x^p\right) \Leftrightarrow \\ \frac{\phi}{2\delta}\left(y^p - y^s\right)\left(y^p + y^s\right) &> G_i^c\left(x^p - x^s\right) - \frac{\phi}{2}\left(x^p - x^s\right)\left(x^s + x^p\right) \end{aligned}$$

Using the expressions for the equilibrium (x^s, y^s, x^p, y^p), $U_i^s > U_i^p$ is equivalent to

$$\begin{aligned}
\frac{\phi}{2\delta}\frac{1}{\phi}\frac{\delta}{1+\delta}\widetilde{G}^s\frac{\delta}{\phi}\frac{2\widetilde{G}^c-\widetilde{G}^s}{1+\delta} &> G_i^c\left(-\frac{1}{\phi}\frac{\delta}{1+\delta}\widetilde{G}^s\right)-\frac{\phi}{2}\left(-\frac{1}{\phi}\frac{\delta}{1+\delta}\widetilde{G}^s\right)\left(\frac{1}{\phi}\frac{2\widetilde{G}^c+\delta\widetilde{G}^s}{1+\delta}\right)\Leftrightarrow\\
\frac{1}{2}\frac{1}{1+\delta}\frac{\delta}{\phi}\frac{2\widetilde{G}^c-\widetilde{G}^s}{1+\delta} &> -G_i^c\frac{1}{\phi}\frac{\delta}{1+\delta}+\frac{1}{2}\frac{\delta}{1+\delta}\frac{1}{\phi}\frac{2\widetilde{G}^c+\delta\widetilde{G}^s}{1+\delta}\Leftrightarrow G_i^c>\frac{\widetilde{G}^s}{2},
\end{aligned}$$

as required, where the pen-ultimate step uses the fact that we focus on $\widetilde{G}^s \geq 0$.

Utilitarian Welfare. Next, we analyze utilitarian welfare. Using the arguments above,

$$\begin{aligned}
U_i^s - U_i^p &= \frac{\gamma_i}{K}x^s + \left[g_i x^s - \frac{\phi\,(x^s)^2}{2} - \frac{\phi\,(y^s)^2}{2\delta}\right]\omega_i - \frac{\gamma_i}{K}x^p - \left[g_i x^p - \frac{\phi\,(x^p)^2}{2} - \frac{\phi\,(y^p)^2}{2\delta}\right]\omega_i\\
&= \left[G_i^c(x^s-x^p) - \frac{\phi}{2}(x^s-x^p)(x^s+x^p) - \frac{\phi}{2\delta}(y^s-y^p)(y^s+y^p)\right]\omega_i\\
&= \frac{1}{\phi}\frac{\delta}{1+\delta}\widetilde{G}^s\left[G_i^c - \frac{1}{2}\frac{2\widetilde{G}^c+\delta\widetilde{G}^s}{1+\delta} + \frac{1}{2}\frac{2\widetilde{G}^c-\widetilde{G}^s}{1+\delta}\right]\omega_i\\
&= \frac{\delta\widetilde{G}^s}{\phi(1+\delta)}\left[G_i^c - \frac{\widetilde{G}^s}{2}\right]\omega_i
\end{aligned}$$

and hence, the difference between utilitarian welfare under shareholder democracy, W^s, and that under under profit maximization, W^p, is

$$W^s - W^p = \frac{\delta\tilde{G}^s}{\phi\,(1+\delta)}\sum_{i=1}^{N}\left(G_i^c - \frac{\tilde{G}^s}{2}\right)\omega_{k(i)}. \tag{38}$$

We can rewrite

$$\sum_i\left(G_i^c - \frac{\tilde{G}^s}{2}\right)\omega_i = \sum_i\left(\frac{\gamma_i}{K\omega_i} + g_i - \frac{\tilde{G}^s}{2}\right)\omega_i = \sum_i\frac{\gamma_i}{K\omega_i}\omega_i + \sum_i g_i\omega_i - \frac{\tilde{G}^s}{2}\sum_i\omega_i.$$

Simplifying,

$$\sum_i\frac{\gamma_i}{K\omega_i}\omega_i = \frac{1}{K}\sum_i\gamma_i = \frac{1}{K}\bar{\gamma}n = m\bar{\gamma}.$$

Next, recall that households within the same type have the same g_i. Let's denote $g_{(k)}$ and $\omega_{(k)}$ the warm glow and wealth of a household of type k. Then

$$\sum_i g_i\omega_i = \sum_{k=1}^{K}\sum_{i:k(i)=k} g_{(k)}\omega_{(k)}.$$

Since there are K types and $n = Km$ households, there are m households in each type, so $\sum_{i:k(i)=k} g_{(k)}\omega_{(k)} = g_{(k)}m\omega_{(k)}$, and hence

$$\sum_i g_i\omega_i = \sum_{k=1}^{K} g_{(k)}m\omega_{(k)} = m\sum_{k=1}^{K} g_{(k)}\omega_{(k)}.$$

Recall that within a given firm j, the combined stake of households of type k is $\omega_{(k)}$. It follows that $\sum_{k=1}^{K} g_{(k)}\omega_{(k)} = \bar{g}$, where $\bar{g}$ was introduced in Section 4.2.2. Indeed,

$$\bar{g} = \sum_{i=1}^{n} g_i\alpha_{ij} = \sum_{k=1}^{K}\sum_{i:k(i)=k} g_i\alpha_{ij} = \sum_{k=1}^{K} g_{(k)}\sum_{i:k(i)=k}\alpha_{ij} = \sum_{k=1}^{K} g_{(k)}\omega_{(k)}. \tag{39}$$

Also note that $\sum_{i=1}^{n}\omega_i = \sum_{k=1}^{K}\left(\sum_{i:k(i)=k}\omega_{(k)}\right)$. Since there are m households of each type, $\sum_{i:k(i)=k}\omega_{(k)} = m\omega_{(k)}$, and hence $\sum_{i=1}^{n}\omega_i = m\sum_{k=1}^{K}\omega_{(k)} = m$. Hence,

$$\begin{aligned} W^s - W^p &= \frac{\delta\tilde{G}^s}{\phi(1+\delta)}\left[\sum_i \frac{\gamma_i}{K\omega_i}\omega_{k(i)} + \sum_i g_i\omega_i - \frac{\tilde{G}^s}{2}\sum_i\omega_i\right] && (40)\\ &= \frac{\delta m\tilde{G}^s}{\phi(1+\delta)}\left[\bar{\gamma} + \bar{g} - \frac{\tilde{G}^s}{2}\right], && (41)\end{aligned}$$

which proves the second part of the proposition.

We next provide derivations for the two examples discussed after the proposition.

Example 1. First, consider the example with $\gamma_i = \gamma$ for all i. In this case, the identity of the median shareholder only depends on ownership stakes, $\omega_i = \omega_{(k)}$ for i of type $k(i) = k$. Suppose types are ordered by wealth, i.e., $\omega_{(1)} < ... < \omega_{(K)}$. Two cases are possible. If $\omega_{(K)} \geq 0.5$, then type K is the median shareholder, so $\tilde{\omega}^s \geq 0.5$. If $\omega_{(K)} < 0.5$, then the median shareholder is among the remaining $K-1$ types, and the lowest stake he can possibly hold is if all remaining types have equal stakes ($\omega_{(1)} = ... = \omega_{(K-1)}$), which implies $\tilde{\omega}^s > 0.5/(K-1)$. In both cases, $\tilde{\omega}^s \geq 0.5/K$. Therefore, $\tilde{G}^s = \mu\frac{\gamma}{K\tilde{\omega}^s} + g \leq 2\mu\gamma + g \leq 2(\gamma + g)$, so utilitarian welfare is higher under shareholder democracy.

Note also that both shareholders' pro-social preferences G^s and citizens' pro-social preferences G^c are ordered by wealth. Hence, the wealth of the median shareholder ($\tilde{\omega}^s$) and the wealth of the median citizen ($\tilde{\omega}^c$) are, respectively, the weighted-median and the median among $\omega_{(1)}, ..., \omega_{(K)}$. Since the weighted-median is higher than the median, we have $\tilde{\omega}^s \geq \tilde{\omega}^c$. This implies

$$\tilde{G}^c = \frac{\gamma}{K\tilde{\omega}^c} + g \geq \frac{\gamma}{K\tilde{\omega}^s} + g \geq \mu\frac{\gamma}{K\tilde{\omega}^s} + g = \tilde{G}^s \geq \frac{\tilde{G}^s}{2},$$

and hence, given (22), the median citizen is better off under shareholder democracy.

Example 2. Second, consider the example with γ_L and γ_H. Denote $\gamma_{(k)}$ the utility benefit parameter of type k. Then $\gamma_{(k)} = \gamma_L$ for $k < \hat{k}$ and $\gamma_{(k)} = \gamma_H$ for $k \geq \hat{k}$, where $\hat{k} > \frac{K}{2}$. Note that both citizens' and shareholders' pro-social preferences, G_i^c and G_i^s, are ordered by $\frac{\gamma_i}{\omega_i}$. Then, for any given $\omega_{(1)}$ and $\omega_{(K)}$, $\frac{\gamma_L}{\omega_{(1)}} < \frac{\gamma_H}{\omega_{(K)}} \Leftrightarrow \frac{\gamma_H}{\gamma_L} > \frac{\omega_{(K)}}{\omega_{(1)}}$. Suppose this condition is satisfied, i.e., $\frac{\gamma_H}{\gamma_L}$ is large enough. Then, for $k < \hat{k}$, we have $\frac{\gamma_{(k)}}{\omega_{(k)}} = \frac{\gamma_L}{\omega_{(k)}} \leq \frac{\gamma_L}{\omega_{(1)}} < \frac{\gamma_H}{\omega_{(K)}}$, whereas for $k \geq \hat{k}$, we have $\frac{\gamma_{(k)}}{\omega_{(k)}} = \frac{\gamma_H}{\omega_{(k)}} \geq \frac{\gamma_H}{\omega_{(K)}}$. Since types $k < \hat{k}$ collectively own less than half of the shares, it follows that the median shareholder (based on G_i^s) has type $k \geq \hat{k}$ and utility benefit γ_H, whereas the median citizen has type $k < \hat{k}$ and utility benefit γ_L. Denote $\tilde{\omega}^s$ the wealth of the median shareholder, and $\tilde{\omega}^c$ the wealth of the median citizen.

Using (22), the median citizen's utility is lower under shareholder democracy if $\frac{2\gamma_L}{K\tilde{\omega}^c} + 2g < \mu\frac{\gamma_H}{K\tilde{\omega}^s} + g$, which is equivalent to $\frac{2}{\mu} + \frac{2g\tilde{\omega}^c K}{\gamma_L \mu} < \frac{\gamma_H}{\gamma_L}\frac{\tilde{\omega}^c}{\tilde{\omega}^s}$, and is thus satisfied for large enough $\frac{\gamma_H}{\gamma_L}$. At the same time, for any given $\frac{\gamma_H}{\gamma_L}$, the median shareholder cannot be too wealthy for the representation problem to dominate. In particular, the median citizen's utility is higher under shareholder democracy if

$$\frac{2\gamma_L}{K\tilde{\omega}^c} + 2g \quad > \quad \mu\frac{\gamma_H}{K\tilde{\omega}^s} + g \Leftrightarrow \left(\frac{2\gamma_L}{K\tilde{\omega}^c} + g\right)\frac{K}{\mu\gamma_H} > \frac{1}{\tilde{\omega}^s} \Leftrightarrow \tilde{\omega}^s > \frac{\mu\gamma_H}{K}\frac{K\tilde{\omega}^c}{2\gamma_L + gK\tilde{\omega}^c}.$$

A sufficient condition for this to hold is $\tilde{\omega}^s > \frac{\mu\gamma_H}{K}\frac{K\tilde{\omega}^c}{2\gamma_L} \Leftrightarrow \frac{\tilde{\omega}^s}{\tilde{\omega}^c} > \frac{\mu}{2}\frac{\gamma_H}{\gamma_L}$.

For example, suppose there are two types, $K = 2$ and $\hat{k} = 1$. Then $\frac{\tilde{\omega}^s}{\tilde{\omega}^c} = \frac{\omega_{(2)}}{1-\omega_{(2)}}$, so the median citizen is better off under shareholder democracy if

$$\frac{\omega_{(2)}}{1-\omega_{(2)}} > \frac{\mu}{2}\frac{\gamma_H}{\gamma_L} \Leftrightarrow \omega_{(2)} > \frac{\mu}{2}\frac{\gamma_H}{\gamma_L} - \frac{\mu}{2}\frac{\gamma_H}{\gamma_L}\omega_{(2)} \Leftrightarrow \omega_{(2)} > \frac{\frac{\mu}{2}\frac{\gamma_H}{\gamma_L}}{1 + \frac{\mu}{2}\frac{\gamma_H}{\gamma_L}},$$

i.e., if wealth inequality is strong enough.

A.5 Proof of Proposition 4

First, consider the effect of an increase in μ on shareholder i's preferences for public good provision and diversion. Recall that they are given by (9) and (10), and the ranking of x_i^s preferred by each shareholder is driven by the ranking of $G_i^s = \mu\frac{\gamma_i}{\omega_i K} + g_i$.

Let $\tilde{\gamma}^{s(\mu)}$, $\tilde{\omega}^{s(\mu)}$, and $\tilde{g}^{s(\mu)}$ denote the private benefit of the public good, wealth, and warm glow of a median shareholder when diversification is equal to μ, and let $\tilde{G}^s(\mu) \equiv \mu\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} + \tilde{g}^{s(\mu)}$. An increase in diversification to $\mu' > \mu$ changes the median shareholder's pro-social preferences by:

$$\Delta_{\tilde{G}^s} \equiv \tilde{G}^s(\mu') - \tilde{G}^s(\mu) = \begin{cases} (\mu' - \mu)\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} \text{ if the median is unchanged,} \\ \mu'\frac{\tilde{\gamma}^{s(\mu')}}{K\tilde{\omega}^{s(\mu')}} - \mu\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} + \tilde{g}^{s(\mu')} - \tilde{g}^{s(\mu)} \text{ otherwise.} \end{cases} \tag{42}$$

We next prove that $\Delta_{\tilde{G}^s} > 0$. There are three cases. First, if the identity of the median shareholder remains the same, $\Delta_{\tilde{G}^s} = (\mu' - \mu)\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} > 0$. Second, if the identity of the median shareholder changes to a shareholder who was previously ranked below the median, it must be that:

$$\mu\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} + \tilde{g}^{s(\mu)} > \mu\frac{\tilde{\gamma}^{s(\mu')}}{K\tilde{\omega}^{s(\mu')}} + \tilde{g}^{s(\mu')}, \tag{43}$$

$$\mu'\frac{\tilde{\gamma}^{s(\mu')}}{K\tilde{\omega}^{s(\mu')}} + \tilde{g}^{s(\mu')} > \mu'\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} + \tilde{g}^{s(\mu)}. \tag{44}$$

Combining (44) and $\mu' > \mu$, we get

$$\mu'\frac{\tilde{\gamma}^{s(\mu')}}{K\tilde{\omega}^{s(\mu')}} + \tilde{g}^{s(\mu')} > \mu'\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} + \tilde{g}^{s(\mu)} > \mu\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} + \tilde{g}^{s(\mu)},$$

which, combined with (42), implies $\Delta_{\tilde{G}^s} > 0$.

Third, if the identity of the median shareholder changes to a shareholder who was previously ranked above the median, it must be that:

$$\mu\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} + \tilde{g}^{s(\mu)} < \mu\frac{\tilde{\gamma}^{s(\mu')}}{K\tilde{\omega}^{s(\mu')}} + \tilde{g}^{s(\mu')}, \tag{45}$$

$$\mu'\frac{\tilde{\gamma}^{s(\mu')}}{K\tilde{\omega}^{s(\mu')}} + \tilde{g}^{s(\mu')} < \mu'\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} + \tilde{g}^{s(\mu)}. \tag{46}$$

Combining (45) and $\mu' > \mu$, we get

$$\mu\frac{\tilde{\gamma}^{s(\mu)}}{K\tilde{\omega}^{s(\mu)}} + \tilde{g}^{s(\mu)} < \mu\frac{\tilde{\gamma}^{s(\mu')}}{K\tilde{\omega}^{s(\mu')}} + \tilde{g}^{s(\mu')} < \mu'\frac{\tilde{\gamma}^{s(\mu')}}{K\tilde{\omega}^{s(\mu')}} + \tilde{g}^{s(\mu')},$$

which, combined with (42), implies that $\Delta_{\tilde{G}^s} > 0$ in this case as well. This proves the first statement of the proposition.

Note also that since G_i^c does not depend on μ, the identity of the median citizen does not change with μ. Using these insights and Eqs. (19) and (20), the change in equilibrium public good provision and diversion following an increase in μ is, respectively,

$$\Delta_{x^s} = \frac{\delta \Delta_{\tilde{G}^s}}{(1+\delta)\phi} > 0, \quad \Delta_{y^s} = -\frac{\delta \Delta_{\tilde{G}^s}}{(1+\delta)\phi} < 0. \tag{47}$$

Next, we study the change in household i's utility. Using (34) and (47),

$$\begin{aligned} & U_i\left(\mu'\right) - U_i\left(\mu\right) \\ = & \left(\frac{\gamma_i}{K} + g_i \omega_i\right) \frac{\delta \Delta_{\tilde{G}^s}}{(1+\delta)\,\phi} + \omega_i \left[\Psi\left(y^{s(\mu)}\right) - \Psi(y^{s(\mu')}) + \Phi\left(x^{s(\mu)}\right) - \Phi(x^{s(\mu')})\right], \end{aligned} \tag{48}$$

where $x^{s(\mu)}$ and $y^{s(\mu)}$ denote the level of public good investment and diversion when diversification is equal to μ. Note that

$$\begin{aligned} \Psi\left(y^{s(\mu)}\right) - \Psi(y^{s(\mu')}) &= \frac{\phi}{2\delta}\left(y^{s(\mu)} - y^{s(\mu')}\right)\left(y^{s(\mu)} + y^{s(\mu')}\right) & (49) \\ &= -\frac{\phi}{2\delta}\Delta_{y^s}\left(y^{s(\mu)} + y^{s(\mu')}\right) = \frac{\Delta_{\tilde{G}^s}}{2\,(1+\delta)}\left(y^{s(\mu)} + y^{s(\mu')}\right) & (50) \end{aligned}$$

and

$$\begin{aligned} \Phi\left(x^{s(\mu)}\right) - \Phi(x^{s(\mu')}) &= \frac{\phi}{2}\left(x^{s(\mu)} - x^{s(\mu')}\right)\left(x^{s(\mu)} + x^{s(\mu')}\right) & (51) \\ &= -\frac{\phi}{2}\Delta_{x^s}\left(x^{s(\mu)} + x^{s(\mu')}\right) = -\frac{\delta \Delta_{\tilde{G}^s}}{2\,(1+\delta)}\left(x^{s(\mu)} + x^{s(\mu')}\right). & (52) \end{aligned}$$

Combining (50), (52), and plugging in (19) and (20), we get

$$\begin{aligned} & \Psi\left(y^{s(\mu)}\right) - \Psi(y^{s(\mu')}) + \Phi\left(x^{s(\mu)}\right) - \Phi(x^{s(\mu')}) = \frac{\Delta_{\tilde{G}^s}}{2\,(1+\delta)}\left[y^{s(\mu)} + y^{s(\mu')} - \delta x^{s(\mu)} - \delta x^{s(\mu')}\right] \\ = & -\frac{\delta \Delta_{\tilde{G}^s}}{2\,(1+\delta)\,\phi}\left[G^s\left(\mu\right) + G^s\left(\mu'\right)\right], \end{aligned}$$

which together with (48), gives

$$U_i\left(\mu'\right) - U_i\left(\mu\right) = \omega_i \frac{\delta \Delta_{\tilde{G}^s}}{(1+\delta)\,\phi}\left[G_i^c - \frac{G^s\left(\mu\right) + G^s\left(\mu'\right)}{2}\right].$$

Thus, an increase in μ increases household's welfare if and only if $G_i^c > \frac{\tilde{G}^s(\mu') + \tilde{G}^s(\mu)}{2}$. This proves the second statement of the proposition. Additionally, since $\tilde{G}^s(\mu') > \tilde{G}^s(\mu)$, we obtain the following sufficient conditions. As μ increases to μ', household i's welfare: (i) increases if $G_i^c > \tilde{G}^s(\mu')$; and (ii) decreases if $G_i^c < \tilde{G}^s(\mu)$.

Finally, consider the impact of changes in μ on $\sigma^s(\mu)$. Recall that the subsidy is set at the level preferred by the median citizen. From (18), citizen i's preferred subsidy is:

$$\sigma_i(\mu) = \frac{G_i^c - \tilde{G}^s(\mu)}{(1+\delta)(1-\mu)}.$$

Notice that the ranking of σ_i depends only on the ranking of G_i^c, which does not depend on μ. Thus, changes in the level of diversification affect the equilibrium subsidy through changes in the median shareholder's pro-socialness $\tilde{G}^s(\mu)$ and scaling of the preference wedge $1/[(1+\delta)(1-\mu)]$. An increase to μ' changes σ^s by:

$$\sigma^s(\mu') - \sigma^s(\mu) = \frac{\tilde{G}^c - \tilde{G}^s(\mu')}{(1+\delta)(1-\mu')} - \frac{\tilde{G}^c - \tilde{G}^s(\mu)}{(1+\delta)(1-\mu)} \tag{53}$$

$$= -\frac{\Delta_{\tilde{G}^s}(1-\mu) + (\mu'-\mu)\left[\tilde{G}^s(\mu) - \tilde{G}^c\right]}{(1+\delta)(1-\mu)(1-\mu')}. \tag{54}$$

Suppose that the median citizen is hurt by shareholder democracy. From (22), this happens when $\tilde{G}^c < \frac{\tilde{G}^s(\mu)}{2}$, which in turn implies $\tilde{G}^s(\mu) - \tilde{G}^c > 0$. Combined with $\Delta_{\tilde{G}^s} > 0$ (as shown above), (54) implies that the increase from μ to μ' reduces the equilibrium subsidy. Since σ^p is independent of μ, ESG backlash, defined as $\sigma^p - \sigma^s$, increases whenever σ^s decreases. This proves the third statement of the proposition.

The proofs for all the extensions, including those discussed in Section 5, are provided in the Online Appendix.

Online Appendix for
"Voting on Public Goods: Citizens vs. Shareholders"

B Extensions

B.1 Voting Through Funds

This appendix presents derivations for the extension in Section 5.1. We first derive the fund manager's preferred x_j given in Eq. (25) and show that her preferred y_j is still given by Eq. (10). The partial derivatives are

$$\frac{\partial U^{FI}}{\partial x_j} = \frac{\sum_{i\in fund}\zeta_i\gamma_i}{n} + \sum_{i\in fund}\zeta_i g_i\alpha_{ij} + \sigma\left(\sum_{i\in fund}\zeta_i\alpha_{ij} - \sum_{i\in fund}\zeta_i\tau_i\right) - \Phi'(x_j)\sum_{i\in fund}\zeta_i\alpha_{ij},$$
$$\frac{\partial U^{FI}}{\partial y_j} = \sigma\left(\sum_{i\in fund}\zeta_i\alpha_{ij} - \sum_{i\in fund}\zeta_i\tau_i\right) - \Psi'(y_j)\sum_{i\in fund}\zeta_i\alpha_{ij}.$$

Rearranging and using that $\alpha_{ij} = \omega_i/(m\mu)$ and $\tau_i = \bar{\alpha}_i = \omega_i/m$, we get:

$$\begin{aligned}\frac{\partial U^{FI}/\partial x_j}{\sum_{i\in fund}\zeta_i\alpha_{ij}} &= \frac{\sum_{i\in fund}\zeta_i\gamma_i}{\sum_{i\in fund}n\zeta_i\alpha_{ij}} + \frac{\sum_{i\in fund}\zeta_i g_i\alpha_{ij}}{\sum_{i\in fund}\zeta_i\alpha_{ij}} + \sigma\left(1 - \frac{\sum_{i\in fund}\zeta_i\bar{\alpha}_i}{\sum_{i\in fund}\zeta_i\alpha_{ij}}\right) - \Phi'(x_j)\\
&= \mu\frac{\sum_{i\in fund}\zeta_i\gamma_i}{\sum_{i\in fund}K\zeta_i\omega_i} + \frac{\sum_{i\in fund}\zeta_i g_i\omega_i}{\sum_{i\in fund}\omega_i} + \sigma\left(1-\mu\right) - \Phi'(x_j)\\
&= \mu\frac{\bar{\gamma}^{FI}}{K\bar{\omega}^{FI}} + \bar{g}^{FI} + \sigma\left(1-\mu\right) - \Phi'(x_j) = \bar{G}^{FI} + \sigma\left(1-\mu\right) - \Phi'(x_j).\end{aligned}$$

Using $\bar{\alpha}_j^{FI} = \sum_{i\in fund}\zeta_i\alpha_{ij}$ in the fund manager's first-order condition, we get Eq. (25):

$$\begin{aligned}\nu\frac{\partial U^{FM}}{\partial x_j} + (1-\nu)\sum_{i\in fund}\zeta_i\alpha_{ij}[\bar{G}^{FI} + \sigma\left(1-\mu\right) - \Phi'(x_j)] = 0 \Leftrightarrow\\
\Phi'(x_j) = \bar{G}^{FI} + \sigma\left(1-\mu\right) + \frac{\nu}{(1-\nu)\bar{\alpha}_j^{FI}}\frac{\partial U^{FM}}{\partial x_j} \Leftrightarrow\\
x_j = \frac{\bar{G}^{FI} + \sigma\left(1-\mu\right)}{\phi} + \frac{\nu g^{FM}}{\phi(1-\nu)\bar{\alpha}_j^{FI}}.\end{aligned}$$

Analogously, for y_j we get Eq. (10):

$$\nu \frac{\partial U^{FM}}{\partial y_j} + (1-\nu) \sum_{i \in fund} \zeta_i \alpha_{ij} [\sigma (1-\mu) - \Psi'(y_j)] = 0 \Leftrightarrow$$
$$\Psi'(y_j) = \sigma (1-\mu) + \frac{\nu}{(1-\nu)\bar{\alpha}_j^{FI}} \frac{\partial U^{FM}}{\partial y_j} \Leftrightarrow$$
$$y_j = \frac{\delta\sigma (1-\mu)}{\phi} + \frac{\delta\nu}{\phi(1-\nu)\bar{\alpha}_j^{FI}} \frac{\partial U^{FM}}{\partial y_j} = \frac{\delta\sigma (1-\mu)}{\phi}.$$

Suppose the fund manager is the median voter. Using the fund manager's preferred x_j and y_j, the FOC (13) in the first stage becomes:

$$\left[G_i^c - \bar{G}^{FI} - \sigma (1-\mu) - \frac{\nu g^{FM}}{(1-\nu)\bar{\alpha}_j^{FI}}\right] \frac{(1-\mu)}{\phi} - \frac{\delta\sigma (1-\mu)^2}{\phi} = 0. \tag{55}$$

Rearranging, we get citizen i's preferred subsidy:

$$\sigma^{fund}(G_i^c) = \frac{G_i^c - \bar{G}^{FI} - \frac{\nu g^{FM}}{(1-\nu)\bar{\alpha}_j^{FI}}}{(1+\delta)(1-\mu)}. \tag{56}$$

As before, the median voter theorem applies. This implies an equilibrium subsidy level $\sigma^{fund}(\tilde{G}^c)$, and equilibrium public good provision and diversion of

$$x^{fund}(\sigma^{fund}) = \frac{\tilde{G}^c + \delta\left(\bar{G}^{FI} + \frac{\nu g^{FM}}{(1-\nu)\bar{\alpha}_j^{FI}}\right)}{\phi(1+\delta)}, \tag{57}$$
$$y^{fund}(\sigma^{fund}) = \frac{\delta\left(\tilde{G}^c - \bar{G}^{FI} - \frac{\nu g^{FM}}{(1-\nu)\bar{\alpha}_j^{FI}}\right)}{\phi(1+\delta)} \tag{58}$$

The fund manager tilts the equilibrium public good investment towards g^{FM}.

B.2 Lobbying

Consider general firm-level quantities $x^*(\sigma + l^*(\sigma))$, $y^*(\sigma + l^*(\sigma))$, and $l^*(\sigma)$. The expected utility of household i can be written as

$$\begin{aligned}
\frac{U_i}{\omega_i} &= \frac{\gamma_i}{K\omega_i} x^*(\sigma + l^*(\sigma)) - (\sigma + l^*(\sigma))(x^*(\sigma + l^*(\sigma)) + y^*(\sigma + l^*(\sigma))) \\
&\quad + \pi + (\sigma + l^*(\sigma))(x^*(\sigma + l^*(\sigma)) + y^*(\sigma + l^*(\sigma))) \\
&\quad - \Phi(x^*(\sigma + l^*(\sigma))) - \Psi(y^*(\sigma + l^*(\sigma))) - \Lambda(l^*(\sigma)) + g_i x^*(\sigma + l^*(\sigma)) \\
&= G_i^c x^*(\sigma + l^*(\sigma)) + \pi - \Phi(x^*(\sigma + l^*(\sigma))) - \Psi(y^*(\sigma + l^*(\sigma))) - \Lambda(l^*(\sigma)).
\end{aligned}$$

Thus, $\frac{\partial U_i}{\partial \sigma} = 0$ if and only if

$$\begin{aligned}
&\left[\begin{array}{c} G_i^c \frac{\partial x^*(\sigma+l^*(\sigma))}{\partial \sigma}\left(1 + \frac{\partial l^*(\sigma)}{\partial \sigma}\right) - \Phi'(x^*(\sigma + l^*(\sigma))) \frac{\partial x^*(\sigma+l^*(\sigma))}{\partial \sigma}\left(1 + \frac{\partial l^*(\sigma)}{\partial \sigma}\right) \\ -\Psi'(y^*(\sigma + l^*(\sigma))) \frac{\partial y^*(\sigma+l^*(\sigma))}{\partial \sigma}\left(1 + \frac{\partial l^*(\sigma)}{\partial \sigma}\right) - \Lambda'(l^*(\sigma)) \frac{\partial l^*(\sigma)}{\partial \sigma} \end{array}\right] = 0 \Leftrightarrow \\
&\left[\begin{array}{c} [G_i^c - \Phi'(x^*(\sigma + l^*(\sigma)))] \frac{\partial x^*(\sigma+l^*(\sigma))}{\partial \sigma} \\ -\Psi'(y^*(\sigma + l^*(\sigma))) \frac{\partial y^*(\sigma+l^*(\sigma))}{\partial \sigma} - \Lambda'(l^*(\sigma)) \frac{\frac{\partial l^*(\sigma)}{\partial \sigma}}{1+\frac{\partial l^*(\sigma)}{\partial \sigma}} \end{array}\right] = 0,
\end{aligned}$$

which gives expression (61).

Lemma 3. *The equilibrium subsidy under profit-maximization is given by (31). Moreover, firms' profits and the median citizen's utility increase in λ.*

Proof. Notice that

$$\begin{aligned}
\frac{U_i^p(\sigma)}{\omega_i} &= G_i^c x^p(\sigma + l^p(\sigma)) + \pi - \frac{\phi}{2}[x^p(\sigma + l^p(\sigma))]^2 - \frac{\phi}{2\delta}[y^p(\sigma + l^p(\sigma))]^2 - \frac{\lambda}{2}[l^p(\sigma)]^2 \\
&= G_i^c x^p + \pi - (1+\delta)\frac{\phi}{2}[x^p(\sigma + l^p(\sigma))]^2 - \frac{\lambda}{2}[l^p(\sigma)]^2 \\
&= G_i^c \frac{\sigma}{\phi - \frac{1+\delta}{\lambda}} + \pi - (1+\delta)\frac{\phi}{2}\left[\frac{\sigma}{\phi - \frac{1+\delta}{\lambda}}\right]^2 - \frac{\lambda}{2}\left[\frac{1+\delta}{\lambda\phi - 1 - \delta}\sigma\right]^2 \\
&= G_i^c \frac{\lambda\sigma}{\phi\lambda - (1+\delta)} - \lambda\frac{1+\delta}{2}\frac{\phi\lambda + 1 + \delta}{(\phi\lambda - (1+\delta))^2}\sigma^2 + \pi.
\end{aligned}$$

Thus, the first order condition implies $\sigma^p = \frac{G_i^c}{1+\delta} - \frac{2G_i^c}{\phi\lambda+1+\delta}$, and applying the median voter theorem gives (31). Next, firm's profit can be written as

$$\Pi(\sigma, l^p(\sigma)) = \pi + \frac{(\sigma + l^p(\sigma))^2}{2}\frac{1+\delta}{\phi} - \lambda\frac{l^p(\sigma)^2}{2} = \pi + \frac{\lambda}{2}\frac{1+\delta}{\lambda\phi - 1 - \delta}\sigma^2.$$

Using (31),

$$\Pi\left(\sigma^p, l^p\left(\sigma^p\right)\right) = \pi + \frac{1}{2}\frac{1}{1+\delta}\frac{\lambda\left(\phi\lambda - 1 - \delta\right)}{\left(\phi\lambda + 1 + \delta\right)^2}\left[\widetilde{G}^c\right]^2,$$

and therefore,

$$\begin{aligned}
\frac{\partial\Pi\left(\sigma^p, l^p\left(\sigma^p\right)\right)}{\partial\lambda} &= \frac{1}{2}\frac{\left[\widetilde{G}^c\right]^2}{1+\delta}\frac{\left(2\phi\lambda - 1 - \delta\right)\left(\phi\lambda + 1 + \delta\right)^2 - \left[\lambda\left(\phi\lambda - 1 - \delta\right)\right]2\phi\left(\phi\lambda + 1 + \delta\right)}{\left(\phi\lambda + 1 + \delta\right)^4} \\
&= \frac{\left[\widetilde{G}^c\right]^2}{2}\frac{3\phi\lambda - 1 - \delta}{\left(\phi\lambda + 1 + \delta\right)^3} > 0,
\end{aligned}$$

as required. Next,

$$\begin{aligned}
\frac{U_i^p\left(\sigma^p, l^p\left(\sigma^p\right)\right)}{\omega_i} &= G_i^c\frac{\lambda\sigma^p}{\lambda\phi - 1 - \delta} + \pi - \frac{1+\delta}{2}\frac{\lambda\left(\lambda\phi + 1 + \delta\right)}{\left(\lambda\phi - 1 - \delta\right)^2}\left[\sigma^p\right]^2 \\
&= \left(G_i^c - \frac{\widetilde{G}^c}{2}\right)\frac{\widetilde{G}^c}{1+\delta}\frac{\lambda}{\phi\lambda + 1 + \delta} + \pi,
\end{aligned}$$

which is increasing in λ if and only if $G_i^c > \frac{\widetilde{G}^c}{2}$. Therefore, $U_i^p\left(\sigma^p, l^p\left(\sigma^p\right)\right)$ increases in λ if $G_i^c = \widetilde{G}^c$ (i.e., for the median citizen), as required. □

Lemma 4. *For a given σ, the optimal lobbying under shareholder democracy is given by (32). The equilibrium subsidy is given by (33). Moreover, firms' profits and the median citizen's utility increase in λ.*

Proof. The first order conditions of (6) with respect to (x_j, y_j, l_j) are:

$$\begin{aligned}
\phi x_j\alpha_{ij} &= \frac{\gamma_i}{n} + g_i\alpha_{ij} + \left(\sigma + l_j\right)\left(\alpha_{ij} - \tau_i\right), \\
\frac{\phi}{\delta}y_j\alpha_{ij} &= \left(\sigma + l_j\right)\left(\alpha_{ij} - \tau_i\right), \\
\lambda l_j\alpha_{ij} &= \left(x_j + y_j\right)\left(\alpha_{ij} - \tau_i\right).
\end{aligned}$$

Recall that $\alpha_{ij} = \frac{\omega_i}{m}\frac{1}{\mu}$ and $\tau_i = \frac{\omega_i}{m}$. Thus, we have

$$\begin{aligned}
x^s\left(\sigma + l^s\right) &= \frac{G_i^s + \left(\sigma + l^s\right)\left(1-\mu\right)}{\phi}, \\
y^s\left(\sigma + l^s\right) &= \frac{\delta\left(\sigma + l^s\right)\left(1-\mu\right)}{\phi}, \\
l^s &= \left(x^s + y^s\right)\frac{1-\mu}{\lambda}.
\end{aligned}$$

The solution of $l^s = \left(x^s\left(\sigma + l^s\right) + y^s\left(\sigma + l^s\right)\right)\frac{1-\mu}{\lambda}$ gives (32). Notice that Assumption

(29) implies $\phi\lambda - (1+\delta)(1-\mu)^2 > 0$ and $l^s(\sigma) > 0$. Overall,

$$\begin{aligned}
\frac{U_i^s(\sigma)}{\omega_i} &= G_i^c x^s(\sigma + l^s(\sigma)) + \pi - \frac{\phi}{2}\left[x^s(\sigma + l^s(\sigma))\right]^2 - \frac{\phi}{2\delta}\left[y^s(\sigma + l^s(\sigma))\right]^2 - \frac{\lambda}{2}\left[l^s(\sigma)\right]^2 \\
&= G_i^c \frac{\widetilde{G}^s + (\sigma + l^s(\sigma))(1-\mu)}{\phi} + \pi - \frac{\phi}{2}\left[\frac{\widetilde{G}^s + (\sigma + l^s(\sigma))(1-\mu)}{\phi}\right]^2 \\
&\quad - \frac{\phi}{2\delta}\left[\frac{\delta(\sigma + l^s(\sigma))(1-\mu)}{\phi}\right]^2 - \frac{\lambda}{2}\left[l^s(\sigma)\right]^2.
\end{aligned}$$

The first order condition with respect to σ is

$$\begin{aligned}
G_i^c - \widetilde{G}^s - (1+\delta)(\sigma + l^s(\sigma))(1-\mu) - \frac{\phi\lambda}{1-\mu} l^s(\sigma)\frac{\frac{\partial l^s(\sigma)}{\partial\sigma}}{1 + \frac{\partial l^s(\sigma)}{\partial\sigma}} &= 0 \Leftrightarrow \\
\frac{G_i^c - \widetilde{G}^s}{(1+\delta)(1-\mu)} - \sigma - 2l^s(\sigma) &= 0 \Leftrightarrow \\
\frac{G_i^c - \widetilde{G}^s}{(1+\delta)(1-\mu)} - \sigma - \frac{2\widetilde{G}^s(1-\mu) + 2\sigma(1+\delta)(1-\mu)^2}{\phi\lambda - (1+\delta)(1-\mu)^2} &= 0 \Leftrightarrow \\
\frac{G_i^c - \widetilde{G}^s}{(1+\delta)(1-\mu)} \frac{\lambda\phi - (1+\delta)(1-\mu)^2}{\lambda\phi + (1+\delta)(1-\mu)^2} - \frac{2\widetilde{G}^s(1-\mu)}{\lambda\phi + (1+\delta)(1-\mu)^2} &= \sigma \Leftrightarrow \\
\frac{G_i^c \frac{\lambda\phi - (1+\delta)(1-\mu)^2}{\lambda\phi + (1+\delta)(1-\mu)^2} - \widetilde{G}^s}{(1+\delta)(1-\mu)} &= \sigma \Leftrightarrow \\
\frac{G_i^c - \widetilde{G}^s}{(1+\delta)(1-\mu)} - \frac{2(1-\mu)G_i^c}{\lambda\phi + (1+\delta)(1-\mu)^2} &= \sigma.
\end{aligned}$$

The median voter theorem implies that the equilibrium subsidy is given by (33). Next, notice that

$$\begin{aligned}
\sigma^s + l^s(\sigma^s) &= \frac{\widetilde{G}^s(1-\mu) + \phi\lambda\sigma^s}{\phi\lambda - (1+\delta)(1-\mu)^2} \\
&= \frac{\widetilde{G}^s(1-\mu) + \phi\lambda\frac{\widetilde{G}^c - \widetilde{G}^s}{(1+\delta)(1-\mu)} - \phi\lambda\frac{2(1-\mu)\widetilde{G}^c}{\lambda\phi + (1+\delta)(1-\mu)^2}}{\phi\lambda - (1+\delta)(1-\mu)^2} \\
&= \frac{1}{(1+\delta)(1-\mu)}\left(\frac{\phi\lambda}{\lambda\phi + (1+\delta)(1-\mu)^2}\widetilde{G}^c - \widetilde{G}^s\right), \qquad (59)
\end{aligned}$$

and that $\sigma^s + l^s(\sigma^s)$ increases with λ. Also notice that

$$l^s(\sigma^s) = \frac{(1-\mu)}{\lambda\phi + (1+\delta)(1-\mu)^2}\widetilde{G}^c \qquad (60)$$

and

$$\begin{aligned}
\frac{\partial\left[\lambda l^s(\sigma^s)^2\right]}{\partial\lambda} &= l^s(\sigma^s)^2 + 2\lambda l^s(\sigma^s)\frac{\partial l^s(\sigma^s)}{\partial\lambda} \\
&= l^s(\sigma^s)\left[l^s(\sigma^s) + 2\lambda\frac{\partial l^s(\sigma^s)}{\partial\lambda}\right] \\
&= l^s(\sigma^s)\left[\frac{(1-\mu)}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c - 2\lambda\frac{(1-\mu)\phi}{\left[\lambda\phi+(1+\delta)(1-\mu)^2\right]^2}\widetilde{G}^c\right] \\
&= -l^s(\sigma^s)\frac{\lambda\phi-(1+\delta)(1-\mu)^2}{\left[\lambda\phi+(1+\delta)(1-\mu)^2\right]^2}(1-\mu)\widetilde{G}^c < 0.
\end{aligned}$$

Since

$$\Pi(\sigma^s, l^s(\sigma^s)) = \pi + \frac{(\sigma^s + l^s(\sigma^s))^2}{2}\frac{1+\delta}{\phi} - \frac{\lambda l^s(\sigma^s)^2}{2},$$

we have $\frac{\partial\Pi(\sigma^s,l^s(\sigma^s))}{\partial\lambda} > 0$. Next,

$$\begin{aligned}
\frac{\partial\left[U_i^s(\sigma^s)\right]}{\partial\lambda} &= \frac{1-\mu}{\phi}\frac{\partial\left[\sigma^s+l^s(\sigma^s)\right]}{\partial\lambda}\begin{pmatrix} G_i^c - \widetilde{G}^s - (\sigma^s+l^s(\sigma^s))(1-\mu)(1+\delta) \\ -\frac{1}{2}\frac{\phi}{1-\mu}\frac{\frac{\partial\left[\lambda l^s(\sigma^s)^2\right]}{\partial\lambda}}{\frac{\partial\left[\sigma^s+l^s(\sigma^s)\right]}{\partial\lambda}}\end{pmatrix} \\
&= \frac{1-\mu}{\phi}\frac{\partial\left[\sigma^s+l^s(\sigma^s)\right]}{\partial\lambda}\begin{pmatrix} G_i^c - \widetilde{G}^s - \frac{1}{(1+\delta)(1-\mu)}\left(\frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c - \widetilde{G}^s\right)(1-\mu)(1+\delta) \\ -\frac{1}{2}\frac{\phi}{1-\mu}\frac{\frac{\partial\left[\lambda l^s(\sigma^s)^2\right]}{\partial\lambda}}{\frac{\partial\left[\sigma^s+l^s(\sigma^s)\right]}{\partial\lambda}}\end{pmatrix} \\
&= \frac{1-\mu}{\phi}\frac{\partial\left[\sigma^s+l^s(\sigma^s)\right]}{\partial\lambda}\begin{pmatrix} G_i^c - \frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c \\ -\frac{1}{2}\frac{\phi}{1-\mu}\frac{\frac{\partial\left[\lambda l^s(\sigma^s)^2\right]}{\partial\lambda}}{\frac{\partial\left[\sigma^s+l^s(\sigma^s)\right]}{\partial\lambda}}\end{pmatrix}.
\end{aligned}$$

Since $\frac{\partial[\sigma^s+l^s(\sigma^s)]}{\partial\lambda} > 0$ and $\frac{\partial\left[\lambda l^s(\sigma^s)^2\right]}{\partial\lambda} < 0$, then $\frac{\partial\left[U_i^s(\sigma^s)\right]}{\partial\lambda} > 0$ if $G_i^c = \widetilde{G}^c$ (i.e., for the median citizen), as required. □

Proof of Proposition 5. We start by generalizing the first order condition for household i's policy preference over the subsidy σ:

$$\begin{aligned}
&\left[G_i^c - \Phi'(x^*(\sigma+l^*(\sigma)))\right]\frac{\partial x^*(\sigma+l^*(\sigma))}{\partial\sigma} \\
&\qquad - \Psi'(y^*(\sigma+l^*(\sigma)))\frac{\partial y^*(\sigma+l^*(\sigma))}{\partial\sigma} - \Lambda'(l^*(\sigma))\frac{\frac{\partial l^*(\sigma)}{\partial\sigma}}{1+\frac{l^*(\sigma)}{\partial\sigma}} = 0.
\end{aligned} \tag{61}$$

If $\delta = 0$, Eq. (61) simplifies to

$$\left[G_i^c - \Phi'(x^*(\sigma+l^*(\sigma)))\right]\frac{\partial x^*(\sigma+l^*(\sigma))}{\partial\sigma} - \Lambda'(l^*(\sigma))\frac{\frac{\partial l^*(\sigma)}{\partial\sigma}}{1+\frac{\partial l^*(\sigma)}{\partial\sigma}} = 0. \tag{62}$$

In particular, it implies that the irrelevance result no longer holds as long as $\frac{\partial l^*(\sigma)}{\partial \sigma}|_{\delta=0} > 0$: even if $\delta = 0$, the equilibrium public good provision under shareholder democracy differs from that under profit maximization. Notice that

$$l^p(\sigma^p) = \frac{1+\delta}{\lambda\phi - 1 - \delta}\sigma^p = \frac{1+\delta}{\lambda\phi - 1 - \delta}\left(\frac{\widetilde{G}^c}{1+\delta} - \frac{2\widetilde{G}^c}{\phi\lambda + 1 + \delta}\right) = \frac{\widetilde{G}^c}{\phi\lambda + 1 + \delta}$$

and

$$\begin{aligned} l^s(\sigma^s) &= (1-\mu)\frac{\widetilde{G}^s + \sigma^s(1+\delta)(1-\mu)}{\phi\lambda - (1+\delta)(1-\mu)^2} \\ &= (1-\mu)\frac{\widetilde{G}^s + \left[\frac{\widetilde{G}^c - \widetilde{G}^s}{(1+\delta)(1-\mu)} - \frac{2(1-\mu)\widetilde{G}^c}{\lambda\phi + (1+\delta)(1-\mu)^2}\right](1+\delta)(1-\mu)}{\phi\lambda - (1+\delta)(1-\mu)^2} \\ &= \frac{(1-\mu)\widetilde{G}^c}{\lambda\phi + (1+\delta)(1-\mu)^2}. \end{aligned}$$

Thus, $l^s(\sigma^s) < l^p(\sigma^p)$ if and only if $(1+\delta)(1-\mu) < \phi\lambda$, which always holds given Assumption (29). This establishes part 1. of the proposition. Consider part 2. - ESG backlash is given by

$$\begin{aligned} \sigma^p - \sigma^s &= \frac{\widetilde{G}^c}{1+\delta} - \frac{2\widetilde{G}^c}{\lambda\phi + 1 + \delta} - \frac{\widetilde{G}^c - \widetilde{G}^s}{(1+\delta)(1-\mu)} + \frac{2(1-\mu)\widetilde{G}^c}{\lambda\phi + (1+\delta)(1-\mu)^2} \\ &= \frac{\widetilde{G}^c}{1+\delta} - \frac{\widetilde{G}^c - \widetilde{G}^s}{(1+\delta)(1-\mu)} - \frac{\lambda\phi - (1+\delta)(1-\mu)}{\lambda\phi + (1+\delta)(1-\mu)^2}\frac{\mu}{\lambda\phi + 1 + \delta}2\widetilde{G}^c \\ &> \frac{\widetilde{G}^c}{1+\delta} - \frac{\widetilde{G}^c - \widetilde{G}^s}{(1+\delta)(1-\mu)}. \end{aligned}$$

Noting that the last row is the same as in the absence of lobbying establishes the result. Finally, consider part 3. Substituting (60) and (59) into $U_i^s(\sigma)$ gives

$$\begin{aligned} U_i^s(\sigma^s) &= \frac{1}{\phi}\frac{1}{(1+\delta)}G_i^c\left[\frac{\phi\lambda}{\lambda\phi + (1+\delta)(1-\mu)^2}\widetilde{G}^c + \delta\widetilde{G}^s\right] \\ &\quad - \frac{1}{(1+\delta)^2}\frac{1}{2\phi}\left[\frac{\phi\lambda}{\lambda\phi + (1+\delta)(1-\mu)^2}\widetilde{G}^c + \delta\widetilde{G}^s\right]^2 \\ &\quad - \frac{1}{(1+\delta)^2}\frac{\delta}{2\phi}\left[\frac{\phi\lambda}{\lambda\phi + (1+\delta)(1-\mu)^2}\widetilde{G}^c - \widetilde{G}^s\right]^2 - \frac{\lambda}{2}\left[\frac{(1-\mu)}{\lambda\phi + (1+\delta)(1-\mu)^2}\widetilde{G}^c\right]^2 + \pi \end{aligned}$$

which implies

$$
\begin{aligned}
U_i^s(\sigma^s) \;=\;& \frac{1}{\phi}\frac{1}{(1+\delta)}G_i^c\left[\frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c+\delta\widetilde{G}^s\right] \\
& -\frac{1}{(1+\delta)^2}\frac{1}{2\phi}\left[\begin{array}{c}\left(\frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c\right)^2+2\left(\frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c\right)\delta\widetilde{G}^s+\left(\delta\widetilde{G}^s\right)^2 \\ +\delta\left(\frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c\right)^2-2\delta\left(\frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c\right)\widetilde{G}^s+\delta\left(\widetilde{G}^s\right)^2\end{array}\right] \\
& -\frac{\lambda}{2}\left[\frac{(1-\mu)}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c\right]^2+\pi
\end{aligned}
$$

and

$$
\begin{aligned}
U_i^s(\sigma^s) \;=\;& \frac{1}{\phi}\frac{1}{(1+\delta)}G_i^c\left[\frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c+\delta\widetilde{G}^s\right] \\
& -\frac{1}{(1+\delta)}\frac{1}{2\phi}\left[\left(\frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c\right)^2+\delta\left(\widetilde{G}^s\right)^2\right] \\
& -\frac{\lambda}{2}\left[\frac{(1-\mu)}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c\right]^2+\pi \\
=\;& \frac{1}{\phi}\frac{1}{(1+\delta)}G_i^c\left[\frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c+\delta\widetilde{G}^s\right] \\
& -\frac{1}{2(1+\delta)}\frac{1}{\phi}\delta\left(\widetilde{G}^s\right)^2-\frac{\lambda}{2(1+\delta)}\frac{1}{\lambda\phi+(1+\delta)(1-\mu)^2}\left(\widetilde{G}^c\right)^2+\pi.
\end{aligned}
$$

Recall from the proof of Lemma 3 that $U_i^p(\sigma^p)=\left(G_i^c-\frac{\widetilde{G}^c}{2}\right)\frac{\widetilde{G}^c}{1+\delta}\frac{\lambda}{\phi\lambda+1+\delta}+\pi$. Thus, $U_i^s(\sigma^s)>U_i^p(\sigma^p)$ if and only if

$$
\begin{aligned}
U_i^s(\sigma^s)-U_i^p(\sigma^p) \;=\;& \frac{1}{\phi}\frac{1}{(1+\delta)}G_i^c\left[\frac{\phi\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}\widetilde{G}^c+\delta\widetilde{G}^s\right]-\frac{1}{2(1+\delta)}\frac{1}{\phi}\delta\left(\widetilde{G}^s\right)^2 \\
& -\frac{\lambda}{2(1+\delta)}\frac{1}{\lambda\phi+(1+\delta)(1-\mu)^2}\left(\widetilde{G}^c\right)^2-\left(G_i^c-\frac{\widetilde{G}^c}{2}\right)\frac{\widetilde{G}^c}{1+\delta}\frac{\lambda}{\phi\lambda+1+\delta} \\
=\;& \left[G_i^c-\frac{\widetilde{G}^c}{2}\right]\widetilde{G}^c\left(\frac{\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}-\frac{\lambda}{\phi\lambda+1+\delta}\right)\frac{1}{1+\delta} \\
& +\left[G_i^c-\frac{\widetilde{G}^s}{2}\right]\widetilde{G}^s\frac{1}{\phi}\frac{\delta}{1+\delta}.
\end{aligned}
$$

Notice that $\frac{\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}-\frac{\lambda}{\phi\lambda+1+\delta}>0$, is decreasing in λ, and converges to zero as $\lambda\to\infty$. Indeed,

$$
\frac{\partial}{\partial\lambda}\left[\frac{\lambda}{\lambda\phi+(1+\delta)(1-\mu)^2}-\frac{\lambda}{\phi\lambda+1+\delta}\right]=\frac{(1+\delta)(1-\mu)^2}{\left[\lambda\phi+(1+\delta)(1-\mu)^2\right]^2}-\frac{1+\delta}{[\phi\lambda+1+\delta]^2},
$$

which is negative if and only if $\lambda\phi > (1+\delta)(1-\mu)$, which holds by Assumption (29). Therefore, if $G_i^c = \widetilde{G}^c$, then $U_i^s(\sigma^s) - U_i^p(\sigma^p)$ decreases in λ, as required. $\square$

B.3 Partially Internalized Warm Glow

In this appendix, we analyze a variation of the model in which households do not fully internalize the warm glow benefit of owning a public-good producing firm when forming their preferences for the subsidy. In particular, we assume that while the public good provision x_j by firm j provides household i with a warm-glow benefit of $\alpha_{ij} g_i x_j$ (which the household fully internalizes at the shareholder voting stage), the household only internalizes a fraction $\eta \in [0,1]$ of this benefit when forming the preference for the subsidy at the political stage. The case $\eta = 1$ corresponds to the baseline model.

Then, the subsidy preferred by household i solves:

$$\max_s U_i(\sigma) = \frac{\gamma_i}{n} X - \tau_i T + \sum_{j=1}^{m} \left[\pi + \eta g_i x_j + \sigma(x_j + y_j) - \Psi(y_j) - \Phi(x_j)\right] \alpha_{ij}$$
$$= \frac{\gamma_i}{n} \sum_{j=1}^{m} x_j - \tau_i \sigma \sum_{j=1}^{m} (x_j + y_j) + \sum_{j=1}^{m} \left[\pi + \eta g_i x_j + \sigma(x_j + y_j) - \Psi(y_j) - \Phi(x_j)\right] \alpha_{ij}.$$

The corresponding FOC is:

$$\left[\frac{\gamma_i}{K\omega_i} + \eta g_i - \phi x(\sigma)\right] \frac{\partial x(\sigma)}{\partial \sigma} - \frac{\phi}{\delta} y(\sigma) \frac{\partial y(\sigma)}{\partial \sigma} = 0. \tag{63}$$

Under profit-maximization, (63) yields:

$$\sigma_i^p(\gamma_i, g_i, \omega_i) = \frac{\frac{\gamma_i}{K\omega_i} + \eta g_i}{1+\delta} = \frac{G_i^c - (1-\eta) g_i}{(1+\delta)}. \tag{64}$$

Under shareholder democracy, if $\mu < 1$, (63) yields:

$$\sigma_i^s(g_i, \gamma_i, \omega_i, \tilde{g}^s) = \frac{\frac{\gamma_i}{K\omega_i} + \eta g_i - \tilde{G}^s}{(1+\delta)(1-\mu)} = \frac{G_i^c - (1-\eta) g_i - \tilde{G}^s}{(1+\delta)(1-\mu)}. \tag{65}$$

The median citizen's preferred subsidy pins down the equilibrium. This analysis implies that when $\eta < 1$, the warm glow utility of the median citizen has a weaker impact on the optimal subsidy, under both profit maximization and shareholder voting. Moreover, Proposition 1 can then be restated as:

If the median shareholder is sufficiently pro-social, such that $\tilde{G}^s > \mu \tilde{G}^c - \mu(1-\eta)\tilde{g}^c$, shareholder democracy results in "ESG backlash," defined as a reduction in the equilibrium subsidy realtive to the level under profit maximization

$$\sigma^p - \sigma^s = \frac{\tilde{G}^s - \mu\tilde{G}^c + \mu(1-\eta)\tilde{g}^c}{(1+\delta)(1-\mu)}. \tag{66}$$

If the median shareholder's pro-social preferences are sufficiently strong, $\tilde{G}^s > \tilde{G}^c - (1 - \eta)\tilde{g}^c$, then the public good is taxed under shareholder democracy, $\sigma^s < 0$.

Intuitively, with $\eta < 1$, citizens favor a lower level of public good provision when voting on the subsidy than when $\eta = 1$. Hence, they prefer taxing rather than subsidizing the public good at lower levels of $\tilde{G}^s$ (pro-social preferences of the median shareholder).

Under profit maximization, the equilibrium public good investment and diversion are

$$x^p(\sigma^p) = \frac{\tilde{G}^c - (1-\eta)\tilde{g}^c}{(1+\delta)\phi}, \tag{67}$$

$$y^p(\sigma^p) = \frac{\delta\left(\tilde{G}^c - (1-\eta)\tilde{g}^c\right)}{(1+\delta)\phi}. \tag{68}$$

Under shareholder democracy, if $\mu < 1$, they are

$$x^s(\sigma^s) = \frac{\tilde{G}^c - (1-\eta)\tilde{g}^c + \delta\tilde{G}^s}{(1+\delta)\phi}, \tag{69}$$

$$y^s(\sigma^s) = \frac{\delta\left(\tilde{G}^c - (1-\eta)\tilde{g}^c - \tilde{G}^s\right)}{(1+\delta)\phi}. \tag{70}$$

Hence, Proposition 2 continues to hold for $\eta < 1$.

To obtain the analog of Proposition 3, we start by comparing the utility of household i under profit maximization and shareholder democracy:

$$\begin{aligned}
U_i^s - U_i^p &= \left[(G_i^c - (1-\eta)g_i)(x^s - x^p) - \frac{\phi}{2}(x^s - x^p)(x^s + x^p) - \frac{\phi}{2\delta}(y^s - y^p)(y^s + y^p)\right]\omega_i \\
&= (x^s - x^p)\left[G_i^c - (1-\eta)g_i - \frac{\phi}{2}\left[x^s + x^p - \frac{y^s + y^p}{\delta}\right]\right]\omega_i \\
&= \frac{\delta\tilde{G}^s}{\phi(1+\delta)}\left[G_i^c - (1-\eta)g_i - \frac{\tilde{G}^s}{2}\right]\omega_i = \frac{\delta\tilde{G}^s}{\phi(1+\delta)}\left[\frac{\gamma_i}{K\omega_i} + \eta g_i - \frac{\tilde{G}^s}{2}\right]\omega_i.
\end{aligned}$$

Aggregating over all i yields the difference in welfare:

$$W^s - W^p = \sum_i^n (U_i^s - U_i^p) = \frac{\delta m\tilde{G}^s}{\phi(1+\delta)}\left[\bar{\gamma} + \eta\bar{g} - \frac{\tilde{G}^s}{2}\right].$$

Hence, if warm glow is only partially internalized ex-ante, shareholder democracy is more likely to hurt a typical citizen and reduce aggregate welfare.

B.4 Scaling Utility From Public Goods

In the main text, in the utility function (1), we scale γ_i by n. Suppose instead that γ_i is not scaled, so that

$$U_i = \gamma_i X + \sum_{j=1}^{m} g_i x_j \alpha_{ij} + C_i. \tag{71}$$

In this case, the first best would solve

$$\begin{aligned}\max_{x_j, y_j} \sum_{i=1}^{n} U_i &= \sum_{i=1}^{n} \left[\gamma_i X + \sum_{j=1}^{m} g_i x_j \alpha_{ij} + C_i \right] \\ &= n\bar{\gamma} \sum_{j=1}^{m} x_j + \sum_{i=1}^{n} \sum_{j=1}^{m} [\pi + g_i x_j - \Phi(x_j) - \Psi(y_j)] \alpha_{ij},\end{aligned}$$

where $\bar{\gamma} \equiv \frac{1}{n} \sum_{i=1}^{n} \gamma_i$. The first-order condition for public good provision now yields the following first-best level of x_j:

$$x_j^{FB} = \frac{n\bar{\gamma} + \bar{g}}{\phi}, \tag{72}$$

with $\lim_{n\to\infty} x_j^{FB} = \infty$. This contrasts with the first-order condition in the baseline model (3), which does not explode as $n \to \infty$. Intuitively, with utility defined as in (71), the marginal benefit of the public good explodes as $n \to \infty$. As a result, it is optimal to provide an infinite amount of public goods. This makes it difficult to conduct welfare analysis, as more public good provision is always better from a societal perspective.

Otherwise, our main results would be similar, with $n\gamma_i$ taking the place of γ_i. Notably, G_i^s and G_i^c would be replaced by, respectively,

$$\begin{aligned}G_i^s &= \mu \frac{n\gamma_i}{K\omega_i} + g_i = \mu \frac{m\gamma_i}{\omega_i} + g_i, \\ G_i^c &= \frac{n\gamma_i}{K\omega_i} + g_i = \frac{m\gamma_i}{\omega_i} + g_i.\end{aligned}$$