

Trading and Shareholder Democracy

Finance Working Paper N° 631/2019

August 2020

Doron Levit

University of Washington and ECGI

Nadya Malenko

University of Michigan, CEPR and ECGI

Ernst Maug

University of Mannheim and ECGI

© Doron Levit, Nadya Malenko and Ernst Maug 2020. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

This paper can be downloaded without charge from:
http://ssrn.com/abstract_id=3463129

www.ecgi.global/content/working-papers

ECGI Working Paper Series in Finance

Trading and Shareholder Democracy

Working Paper N° 631/2019

August 2020

Doron Levit
Nadya Malenko
Ernst Maug

Previous versions of this paper were circulated under the title “Trading and Shareholder Voting.” We are grateful to Tim Adam, Heski Bar-Isaac, Alon Brav, Jonathan Cohn, Martin Gregor, Denis Gromb, Andrey Malenko, Robert Marquez, Kristian Rydqvist, Miriam Schwartz-Ziv, Laura Starks, Fabio Trojani, Alexander Wagner, Avi Wohl, Ming Yang, Michael Zierhut, conference participants at the 2020 RCFS/RAPS Winter Conference, SFS Cavalcade, UBC Winter Conference, the 2020 meetings of the Western Finance Association and the Midwest Finance Association, and seminar participants at Boston University, Columbia University, Cornell University, Drexel University, Duke University, Frankfurt School of Finance and Management, Geneva Finance Research Institute, Hong Kong University of Science and Technology, Humboldt University in Berlin, IDC Herzliya, Imperial College London, Indiana University, Johns Hopkins University, Laval University, London School of Economics, NYU School of Law, Pennsylvania State University, Queen Mary University of London, University of Cambridge, University of Maryland, University of Miami, University of Oklahoma, University of Texas at Dallas, University of Toronto, University of Washington, University of Wisconsin-Madison, and Washington University in St. Louis for helpful comments and discussions. We also thank Yichun Dong for research assistance.

© Doron Levit, Nadya Malenko and Ernst Maug 2020. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Abstract

We study shareholder voting in a model in which trading affects the composition of the shareholder base. Trading and voting are complementary, which gives rise to self-fulfilling expectations about proposal acceptance and multiple equilibria. Prices and shareholder welfare can move in opposite directions, so the former may be an invalid proxy for the latter. Increasing liquidity can reduce welfare, because it allows extreme shareholders to gain more weight in voting. Delegating decision-making to the board can improve shareholder value. However, the optimal board is biased, does not represent current shareholders, and may not garner support from the majority of shareholders.

Keywords: Corporate Governance, Voting, Shareholder Rights, Trading, Delegation

JEL Classifications: D74, D83, G34, K22

Doron Levit

Associate Professor of Finance and Business Economics
University of Washington, Foster School of Business
434 Paccar Hall, 4273 E Stevens Way NE
Seattle, WA 98195, United States
phone: +1 206-543-3021
e-mail: dlevit@uw.edu

Nadya Malenko

Associate Professor of Finance
Ross School of Business, University of Michigan
701 Tappan Street
Ann Arbor, MI 48109, United States
phone:
e-mail: nmalenko@umich.edu <nmalenko@umich.edu>;

Ernst Maug*

Professor of Corporate Finance
University of Mannheim, Business School
L9 1-2
68161 Mannheim, Germany
phone: +49 621 181 1952
e-mail: maug@uni-mannheim.de

*Corresponding Author

Trading and Shareholder Democracy*

Doron Levit[†]

Nadya Malenko[‡]

Ernst Maug[§]

August 17, 2020

Abstract

We study shareholder voting in a model in which trading affects the composition of the shareholder base. Trading and voting are complementary, which gives rise to self-fulfilling expectations about proposal acceptance and multiple equilibria. Prices and shareholder welfare can move in opposite directions, so the former may be an invalid proxy for the latter. Increasing liquidity can reduce welfare, because it allows extreme shareholders to gain more weight in voting. Delegating decision-making to the board can improve shareholder value. However, the optimal board is biased, does not represent current shareholders, and may not garner support from the majority of shareholders.

Keywords: Corporate Governance, Voting, Shareholder Rights, Trading, Delegation

JEL classifications: D74, D83, G34, K22

*Previous versions of this paper were circulated under the title “Trading and Shareholder Voting.” We are grateful to Tim Adam, Heski Bar-Isaac, Alon Brav, Jonathan Cohn, Martin Gregor, Denis Gromb, Andrey Malenko, Robert Marquez, Kristian Rydqvist, Miriam Schwartz-Ziv, Laura Starks, Fabio Trojani, Alexander Wagner, Avi Wohl, Ming Yang, Michael Zierhut, conference participants at the 2020 RCFS/RAPS Winter Conference, SFS Cavalcade, UBC Winter Conference, the 2020 meetings of the Western Finance Association and the Midwest Finance Association, and seminar participants at Boston University, Columbia University, Cornell University, Drexel University, Duke University, Frankfurt School of Finance and Management, Geneva Finance Research Institute, Hong Kong University of Science and Technology, Humboldt University in Berlin, IDC Herzliya, Imperial College London, Indiana University, Johns Hopkins University, Laval University, London School of Economics, NYU School of Law, Pennsylvania State University, Queen Mary University of London, University of Cambridge, University of Maryland, University of Miami, University of Oklahoma, University of Texas at Dallas, University of Toronto, University of Washington, University of Wisconsin-Madison, and Washington University in St. Louis for helpful comments and discussions. We also thank Yichun Dong for research assistance. The Online Appendix can be accessed at https://www.nadyamalenko.com/Levit,Malenko,Maug_OnlineAppendix.pdf

[†]University of Washington and ECGI. Email: dlevit@uw.edu.

[‡]University of Michigan, CEPR, and ECGI. Email: nmalenko@umich.edu.

[§]University of Mannheim and ECGI. Email: maug@uni-mannheim.de.

“Shareholders express views by buying and selling shares; (...) The more shareholders govern, the more poorly the firms do in the marketplace. Shareholders’ interests are protected not by voting, but by the market for stock (...).” (Easterbrook and Fischel (1983), pp. 396-397)

1 Introduction

In many advanced economies, regulatory reforms and charter amendments have empowered shareholders and enhanced their voting rights in an effort to constrain managerial discretion.¹ As a result, shareholders not only elect directors, but frequently vote on executive compensation, corporate transactions, changes to the corporate charter, and social or environmental policies. This shift of power from boards to shareholder meetings takes for granted that shareholder voting increases shareholder welfare and firm valuations by aligning the preferences of those who make decisions with those for whom decisions are made – a form of “corporate democracy.”² However, unlike the political setting, a key feature of the corporate setting is the existence of the market for shares, which allows investors to choose their ownership stakes based on their preferences and the stock price. Thus, who gets to vote on the firm’s policies is fundamentally linked to voters’ views on how the firm should be run. While the literature has looked at many important questions in the context of shareholder voting, it has so far not examined the effectiveness of voting when the shareholder base forms endogenously through trading.³ The main goal of this paper is to examine the link between trading and voting and its implications for shareholder welfare, and to highlight how the effectiveness of shareholder voting vis-a-vis board decision-making is affected by the firm’s trading environment.

Specifically, we study the relationship between trading and voting in a context in which shareholders differ in their attitudes toward proposals. We provide several key insights. First, trading aligns the shareholder base with the expected outcome, even if the expected outcome

¹Cremers and Sepe (2016) make the same observation and review the large legal literature on the subject (see also Hayden and Bodie, 2008). The finance literature has assembled a wealth of empirical evidence on this shift, including the discussion on the effectiveness of say-on-pay votes, surveyed by Ferri and Göx (2018), reforms to disclose mutual fund votes in the United States (e.g., Davis and Kim, 2007; Cvijanovic, Dasgupta, and Zachariadis, 2016), and the introduction of mandatory voting on some takeover proposals in the UK (Becht, Polo, and Rossi, 2016).

²E.g., the speech by SEC Commissioner Aguilar (<https://www.sec.gov/news/speech/2009/spch102909laa.htm>).

³Karpoff (2001) surveys the earlier and Yermack (2010) the later literature on shareholder voting.

is not optimal. There can even be multiple equilibria, so that similar firms can end up having very different ownership structures and taking very different strategic directions – a source of non-fundamental indeterminacy. Second, changes in the governance environment of the firm can affect shareholder welfare and prices in opposite directions, which suggests that price reactions to voting outcomes may not be a valid empirical proxy for their welfare effects. Third, while higher market liquidity increases the ability of shareholders to gain from trade, it may nevertheless reduce welfare by allowing the shareholder base to become more extreme, so that the views of more extreme shareholders prevail over those with more moderate attitudes. Finally, shareholder welfare can be increased if, instead of voting, decisions are delegated to a board of directors, but only if the board is biased and does not represent the average shareholder. However, short-term trading considerations may prevent the optimal board from getting the support of the majority of shareholders. In addition, we analyze several actively-debated governance issues, such as the role of index investors and the growing importance of environmental and social proposals.

We consider a model in which a continuum of shareholders first trade their shares in a competitive market and then vote on a proposal. Each shareholder’s valuation of the proposal depends on an uncertain common value that all shareholders share, but also on a private value that reflects shareholders’ different attitudes toward the proposal. After shareholders trade, but before they vote, they observe a signal on the proposal’s common value; the signal is public and there is no asymmetric information. Because of private values, some shareholders are biased toward the proposal and vote to accept it even if the common value is expected to be low; we call them *activist* shareholders, because they want to change the status quo. By contrast, other shareholders are biased against the proposal and have a higher bar for accepting it; we call them *conservative*, since they are biased in favor of the status quo. These different attitudes between shareholders may reflect private benefits from their ties with the company or ownership of other firms, different social or political views (“investor ideology”), time horizons, risk aversion, and tax considerations.⁴ Some commentators even argue that shareholder voting

⁴Cvijanovic, Dasgupta, and Zachariadis (2016) and He, Huang, and Zhao (2019) analyze the heterogeneity between mutual funds arising from conflicts of interest or common ownership, and Matvos and Ostrovsky (2010) show that funds differ systematically in their support for management. Some shareholders have interests that set them apart from other shareholders, e.g., unions (Agrawal, 2012), family shareholders and founders (Mullins and Schoar, 2016; Villalonga and Amit, 2006), CEOs, and governments. Bolton et al. (2019) and Bubb and Catan (2019) develop different classifications of shareholders’ attitudes to corporate governance. Bushee (1998)

should be seen as a system to aggregate heterogeneous preferences (Hayden and Bodie, 2008).

We start by analyzing the setting in which shareholders can trade but cannot vote, e.g., if the decision on the proposal is taken by the board of directors. Because of heterogeneous preferences, shareholders differ in their valuation of the firm, which creates gains from trade. The equilibrium is unique and can be of two types: if the probability of proposal adoption is above a certain threshold, then activist shareholders value the firm more than conservative shareholders and buy shares from them, whereas in the opposite case, conservatives buy and activists sell. Thus, trading allows matching between shareholders and firms: Shareholders who do not agree with the firm's decisions sell to those who expect their preferred alternative to be chosen, and thereby benefit from the higher price the buyers are willing to pay.

By contrast, if the decision on the proposal is made by a shareholder vote, then multiple equilibria can arise. An *activist* equilibrium, in which the proposal is accepted with a relatively high probability, can co-exist with a *conservative* equilibrium, in which the proposal is likely to be rejected. Multiplicity arises because voting and trading are complements: If shareholders expect a high (low) likelihood of proposal adoption, the more conservative shareholders sell to (buy from) the more activist shareholders. As a result, the shareholder base after trading is more activist (conservative) and proposals are approved more (less) often, confirming the ex-ante expectations. Such multiplicity is especially likely when liquidity or the heterogeneity of the initial shareholder base are high. The multiplicity of equilibria highlights potential empirical challenges in analyzing shareholder voting, since firms with the same fundamental characteristics can have different ownership structures and adopt different policies.

Next, we explore prices and shareholder welfare, and highlight that they are different and may even move in opposite directions. We first note that the decision on the proposal depends on the identity of the marginal voter, who is indifferent between accepting and rejecting the proposal if it just passes. For example, under simple majority, the marginal voter is the median voter among those shareholders who hold shares after trading. However, the share price depends on how proposal adoption affects the valuation of the marginal trader, who is just indifferent between buying and selling shares. Hence, if the gap between the marginal voter and the marginal trader widens, the share price decreases. Finally, we show that shareholder

and Gaspar, Massa, and Matos (2005) analyze the implications of differences in time horizons between investors. Desai and Jin (2011) study differences in shareholder tax characteristics. Hayden and Bodie (2008) provide a comprehensive overview of different sources of shareholder heterogeneity.

welfare, which we define as the average valuation of the initial shareholders, depends on how the decision on the proposal affects the valuation of the average shareholder who holds shares after trading. Hence, if the gap between the marginal voter and the average post-trade shareholder widens, *ex ante* shareholder welfare declines.

Price and shareholder welfare react differently to policy changes, and may even move in opposite directions, because they are determined by, respectively, the valuation of the marginal trader and the valuation of the average shareholder. In particular, consider the case in which the marginal voter is more extreme than the marginal trader, but less extreme than the average post-trade shareholder. Then a policy change, such as an increase in the majority requirement, either shifts the marginal voter towards the marginal trader but farther away from the average post-trade shareholder, or the opposite. Hence, prices increase (decrease) exactly when shareholder welfare decreases (increases). This result challenges the notion that there is a close connection between shareholder welfare and prices. It casts doubt on the common interpretation of event studies, which are prevalent in empirical work on shareholder voting.

Our analysis also uncovers a novel effect of financial markets on shareholder welfare. If shareholders do not vote, e.g., if decisions over the proposal are made by the board, greater opportunities to trade and higher liquidity always increase welfare: Shareholder heterogeneity creates gains from trade, and more liquid markets allow more gains from trade to be realized. However, when decisions are made by a shareholder vote, trading may be detrimental to shareholder welfare. Intuitively, greater opportunities to trade lead to larger shifts in the shareholder base and make the marginal voter more extreme, which may widen the gap between the marginal voter and the average shareholder and thereby reduce welfare. By highlighting this effect, our paper contributes to the literature on real effects of financial markets (see [Bond, Edmans, and Goldstein \(2012\)](#) for a survey).

Finally, we examine the optimal allocation of power between boards and shareholder meetings by comparing welfare in the two settings described above – when shareholders trade and vote; and when shareholders trade but decisions are made by the board. The board, like each of the shareholders, is characterized by its attitude toward the proposal.

We define the optimal board as that which maximizes the initial shareholder welfare. We first show that the optimal board is biased and does not reflect the preferences of the initial shareholder base; instead, it maximizes the average valuation of the post-trade shareholder

base. Intuitively, the optimal board caters to the preferences of the shareholders with the highest willingness to pay, rather than to the average pre-trade shareholder. Indeed, if the board's preferences are aligned with those of more extreme shareholders, it also benefits shareholders with more moderate views, who can now sell their shares to those with more extreme views for a higher price. Essentially, the design of an optimal board accounts for gains from trade between shareholders with different views. Importantly, this biased optimal board, as well as a "good enough" board that is sufficiently similar to the optimal board, increases shareholder welfare relative to decision-making via shareholder voting. In other words, the argument that whenever the board is biased, decisions should be delegated to shareholders, is not necessarily correct if shareholders can trade. Similarly, the objective of the optimal board should not be to maximize the share price, since the price reflects only the preferences of the marginal trader and not those of the average shareholder.

Even if it is optimal to delegate decision-making to the board, it is not guaranteed that the majority of shareholders will want to do so. To show this, we extend the model by adding a stage before trading in which shareholders vote on whether to delegate the decision on the proposal to the board. We show that shareholders may choose not to delegate decision-making to a board, not even an optimal board, because with voting before trading, a new externality arises: Shareholders who expect to buy shares after the vote on delegation consider not only the implications of delegation for the long-term value of the firm, but also for the short-term price at which they can buy shares from those shareholders who sell. As a result, short-term trading considerations may push these shareholders to vote against delegation to an optimal board in order to benefit from a lower price.

Overall, we strike a cautious note on the general movement to "shareholder democracy" since voting may lead to suboptimal outcomes when shareholders can trade. As we show, trading allows shareholders with more extreme preferences to build large positions and use their voting power to implement their preferred policies, which can hurt more moderate shareholders and decrease shareholder welfare. Delegating decisions to the board may dominate decision-making via shareholder voting even if the board is biased and pursues interests different from those of the average shareholder. However, shareholders might make incorrect decisions when voting to delegate authority to the board since they always give some weight to short-term trading considerations. As such, we resonate the critical stance of [Easterbrook and Fischel](#)

(1983) in the opening vignette.

2 Discussion of the literature

Our paper is related to the theoretical literature on shareholder voting (e.g., [Maug and Rydqvist, 2009](#); [Levit and Malenko, 2011](#); [Van Wesep, 2014](#); [Malenko and Malenko, 2019](#); [Bar-Isaac and Shapiro, 2019](#); and [Cvijanovic, Groen-Xu, and Zachariadis, 2020](#)). These papers all assume an exogenous shareholder base and discuss strategic interactions between shareholders based on heterogeneous information (building on the strategic voting literature, e.g., [Austen-Smith and Banks \(1996\)](#) and [Feddersen and Pesendorfer \(1996\)](#)), heterogeneous preferences, or both. [Bernhardt, Liu, and Marquez \(2018\)](#) show that the combined acquirer-target return could be a poor proxy for the welfare consequences of mergers when shareholders have heterogeneous valuations, which is related to our result that prices and welfare could move in opposite directions. Differently from this paper and other papers in this strand of the literature, our analysis endogenizes the shareholder base by studying how the voting equilibrium changes if shareholders can trade in anticipation of voting outcomes. [Musto and Yilmaz \(2003\)](#) analyze how adding a financial market changes political voting outcomes. However, in their model voters trade financial claims but not the votes, which is different from the corporate context. Overall, our paper contributes to this literature by overcoming an important theoretical challenge when analyzing shareholder voting: Shareholders' valuations and their trading decisions depend on expected voting outcomes, but voting outcomes depend in turn on the composition of the shareholder base, which is endogenous and changes through trading.

We are aware of three strands of literature that integrate the analysis of shareholder voting with trading. The first is the literature on general equilibrium economies with incomplete markets, which recognizes that shareholders with different preferences will be unanimous and production decisions can be separated from consumption decisions (Fisher separation) only if markets are complete and perfectly competitive.⁵ With incomplete or imperfectly competitive markets, shareholders will generally disagree about the optimal production plans of the firm, since they are not only interested in profit maximization but also in the effect of firms' decisions

⁵See [Gevers \(1974\)](#), [Drèze \(1985\)](#), [DeMarzo \(1993\)](#), and [Kelsey and Milne \(1996\)](#) on incomplete markets and [Demichelis and Ritzberger \(2011\)](#) on imperfect competition. [Hirshleifer \(1966\)](#) shows that Fisher separation obtains in an inter-temporal production economy with complete markets in a state-preference framework.

on product prices (e.g., [Kelsey and Milne, 1996](#)). Then conflicts of interest arise, governance mechanisms become necessary, and the objective of the firm becomes undefined. The models in this literature introduce mechanisms such as voting, blockholders, or boards of directors to close this gap.⁶ Compared to this earlier literature, we analyze a less general model, which allows us to characterize equilibria beyond existence, analyze the way in which voting and trading interact, derive implications for shareholder welfare, and characterize delegation decisions and their properties. [Meirowitz and Pi \(2020\)](#) also study the interaction between trading and voting, but differently from our focus on the endogenous shareholder base, examine how shareholders' ability to trade *after* voting affects information aggregation.

The second literature analyzes the issues that arise when financial markets allow traders to exercise voting rights without exposure to the firm's cash flows. [Blair, Golbe, and Gerard \(1989\)](#), [Neeman and Orosel \(2006\)](#), and [Kalay and Pant \(2009\)](#) show that vote-buying can enhance the efficiency of contests for corporate control, while [Speit and Voss \(2020\)](#) show that it can enable a hostile activist to destroy value. [Brav and Mathews \(2011\)](#) conclude that the implications of empty voting for efficiency are ambiguous and depend on transaction costs and shareholders' ability to evaluate proposals. [Esö, Hansen, and White \(2014\)](#) argue that empty voting may improve information aggregation. Our paper is complementary to this literature, since we abstract from derivatives markets and vote-trading and assume one-share-one-vote throughout.⁷ The political science literature on vote-trading reflects a closely related idea.⁸ This literature investigates vote-trading as a mechanism to address a limitation of standard voting rules, which do not reflect the intensity of preferences (e.g., see [Casella, Llorente-Saguer, and Palfrey \(2012\)](#), [Lalley and Weyl \(2018\)](#), and references therein). However, in this literature, agents trade votes but not their exposure to the voting outcome, whereas in our model cash flows are tied to voting rights and always traded in the same proportion. This feature of most publicly traded stocks is critical for our main results.

The third literature analyzes blockholders who form large blocks endogenously through trading and affect governance through voice or exit (see [Edmans \(2014\)](#) and [Edmans and](#)

⁶See [Gevers \(1974\)](#), [Drèze \(1985\)](#), and [DeMarzo \(1993\)](#) on majority voting. [Drèze \(1985\)](#) and [DeMarzo \(1993\)](#) conceptualize the board of directors as a group of controlling blockholders.

⁷[Burkart and Lee \(2008\)](#) provide a survey of the theoretical literature on the one-share-one-vote structure.

⁸The endogeneity of the voter base in our model also connects our paper to the literature on voter participation and voluntary voting (e.g., [Palfrey and Rosenthal, 1985](#); [Krishna and Morgan, 2011, 2012](#)).

Holderness (2017) for surveys). However, this literature does not focus on the complementarities and collective action problems that arise in our model, as the majority of this literature focuses on models with a single blockholder. Relative to existing governance models of multiple blockholders, our paper analyzes the feedback loop between voting and trading and how this affects the choice between delegation to a board and shareholder voting.^{9,10}

Finally, our paper contributes to the literature on the allocation of control between shareholders and management (e.g., Burkart, Gromb, and Panunzi (1997), Harris and Raviv (2010), and Chakraborty and Yilmaz (2017)) by showing how the optimal balance of power depends on the firm's trading environment.

3 Model

Consider a firm with a continuum of measure one of risk-neutral shareholders. Each shareholder is endowed with $e > 0$ shares. Shareholders choose between two alternative policies by voting on a proposal, such that one policy is implemented if the proposal is rejected ($d = 0$), and another policy is implemented if it is accepted ($d = 1$). For example, by voting on a proposal to remove a takeover defense, shareholders might induce the firm to cut R&D and effectively change its investment strategy from a longer-term to a shorter-term policy.¹¹

Preferences. Shareholders' preferences over the two policies depend on a common value component and on shareholders' private values. The common value is determined by an unknown state $\theta \in \{-1, 1\}$: if $\theta = -1$ ($\theta = 1$), rejecting the proposal and implementing the first policy is value-increasing (decreasing); and, vice versa, if $\theta = 1$ ($\theta = -1$), accepting the proposal and implementing the second policy is value-increasing (decreasing). Thus, for the common value it is critical that the policy matches the state, i.e., that the proposal is accepted if and only if $\theta = 1$. Similar setups are employed in the strategic voting literature,

⁹See Zwiebel, 1995; Noe, 2002; Edmans and Manso, 2011; Dhillon and Rossetto (2015); and Brav, Dasgupta, and Mathews, 2017.

¹⁰Garlappi, Giammarino, and Lazrak (2017; 2019) analyze group decision-making about investment projects and show how trade among group members may overcome inefficiencies from differences in beliefs. These papers focus on the dynamics of group decision-making and do not feature the mechanisms and results that arise in our model.

¹¹By making the firm more susceptible to hostile takeovers and shareholder activism, removal of antitakeover defenses may induce managerial short-termism, such as cutting R&D and other long-term investment. See, e.g., Stein (1988) for a model deriving this prediction and Atanassov (2013) for empirical evidence.

e.g., [Austen-Smith and Banks \(1996\)](#) and [Feddersen and Pesendorfer \(1996\)](#). For example, in the case of a proposal that would lead to cutting R&D, $\theta = 1$ ($\theta = -1$) corresponds to shorter-term (longer-term) projects having a higher NPV, so that approving (rejecting) the proposal is value-increasing if and only if $\theta = 1$ ($\theta = -1$).

In addition to the common value component, shareholders have private values over the two policies, which reflect the heterogeneity in their preferences. For brevity and ease of exposition, we refer to these private values as biases and denote them by $b \in [-\bar{b}, \bar{b}]$. A shareholder with bias $b > 0$ ($b < 0$) receives additional (dis)utility if the proposal is accepted and the second policy is adopted, and experiences an additional loss (gain) if the proposal is rejected and the first policy is adopted. The initial shareholder base, i.e., the cross section of shareholders' biases b , is given by a differentiable cdf G , which is publicly known and has full support with positive density g on $[-\bar{b}, \bar{b}]$, where $\bar{b} > 0$ measures shareholder heterogeneity.

Heterogeneity in preferences can stem from time horizons, private benefits, social or political views, common ownership, risk aversion, or tax considerations. As noted in the Introduction, the evidence for preference heterogeneity is pervasive. In the R&D example, suppose that b captures variation in investors' time horizons, and a larger b reflects a shorter horizon, i.e., more impatience. Then, shareholders with a larger b get more utility from a shorter-term strategy and more disutility from a longer-term strategy relative to those with a smaller b .

Overall, we assume that the value of a share from the perspective of shareholder b is

$$v(d, \theta, b) = v_0 + (\theta + b)(d - \phi) = v_0 + \begin{cases} \phi(-\theta - b) & \text{if } d = 0, \\ (1 - \phi)(\theta + b) & \text{if } d = 1, \end{cases} \quad (1)$$

where $v_0 \geq 0$ captures the part of valuation that is not affected by the decision between the two policies and is sufficiently large to ensure that shareholder value is always non-negative. Parameter $\phi \in [0, 1]$ is the weight of the first policy (proposal rejection), and $1 - \phi$ is the weight of the second policy (proposal acceptance). In the symmetric case, $\phi = \frac{1}{2}$, and from the perspective of shareholder b , the gain from making the right decision equals the loss from making the wrong decision. This captures situations in which the two policies are in conflict with each other — for example, a choice between a short-term vs. long-term investment project (for a proposal that would cut R&D), a choice between a shareholder-friendly vs. management-

friendly governance structure (for a proposal to destagger the board), or a choice between a more vs. less socially responsible corporate strategy (for social and environmental proposals).

In other cases, in which the two policies are not as related, shareholders may only disagree in their assessment of just one of them, so that ϕ is close to 0 or 1. For example, $\phi = 0$ captures a proposal to invest in a new project that is completely independent of the firm's assets in place, when the valuation of assets in place is common knowledge and the same for all shareholders. Most of our results hold for any ϕ , and we discuss the specific results for which this parameter plays a more important role below.

Because of private values, shareholders apply different hurdle rates for accepting the proposal. Specifically, for any ϕ , a shareholder with bias b would like the proposal to be accepted if and only if his expectation of $\theta + b$ is positive. To facilitate the exposition, we will refer to the first policy, which is implemented upon the rejection of the proposal, as the status quo, and to high (low) b shareholders as “activist” (“conservative”), because a high b is associated with a bias against (toward) the status quo.

Timeline. The game has two stages: first, trading and then, voting. This timing allows us to focus on the endogeneity of the voter base, which is crucial for our analysis. At the outset, all shareholders are uninformed about the value of θ ; they all have the same prior on its distribution, which we specify below. Then trading takes place. Short sales are not allowed. In the baseline model, shareholders can either sell any number of shares up to their entire endowment e , or buy any number of shares up to a fixed finite quantity $x > 0$, or not trade. The quantity x captures trading frictions (e.g., illiquidity, transaction costs, wealth constraints), which limit shareholders' ability to build large positions in the firm.¹²

In equilibrium the market must clear, and we denote the market clearing share price by p . To ease the notation in the analysis below, we define

$$\delta \equiv \frac{x}{x + e}, \tag{2}$$

which captures the relative strength with which shareholders can buy shares. In this model, δ captures shareholders' opportunities to trade, and we will refer to it as market liquidity or

¹²For simplicity, we consider one round of trade, but allowing for multiple rounds of trade prior to the vote would not change the properties of the equilibrium as long as we keep the same restriction on the aggregate number of shares that can be bought, x . In Section 7.4, we analyze a second round of trade *after* the vote.

market depth. We assume that shareholders do not trade if they are indifferent between trading at the market price p and not trading at all. This tie-breaking rule could be rationalized by adding arbitrarily small transaction costs.¹³

After the market clears, but before voting takes place, all shareholders observe a public signal about the state θ . This public information may stem from disclosures by management, analysts, or proxy advisors. Let $q = \mathbb{E}[\theta|\text{public signal}]$ be the shareholders' posterior expectation of the state following the signal. For simplicity and ease of exposition, we assume that the public signal is q itself, and that q is distributed according to a differentiable cdf F with mean zero and full support with positive density f on $[-\Delta, \Delta]$, where $\Delta \in (0, 1)$. Thus, the ex-ante expectation of θ is zero. The symmetry of the support of q around zero is not necessary for any of the main results. To simplify the exposition, it is useful to introduce

$$H(q) \equiv 1 - F(q). \quad (3)$$

At the second stage, after observing the public signal q , each shareholder votes the shares he owns after the trading stage, based on his preferences and the realization of q . Shareholders vote either in favor or against the proposal. Each share has one vote. If a proportion of more than $\tau \in (0, 1)$ of all shares are cast in favor of the proposal, the proposal is accepted. Otherwise, the proposal is rejected. Parameter τ captures not only the statutory majority requirement, but also the power of the CEO, the independence of the board, and shareholder rights: The combination of all of these factors determines how much effective power shareholder votes have to change corporate policies, especially for non-binding proposals.¹⁴

The timeline of the model aligns well with observed practices. In the model, trading determines the voter base, which puts the record date, i.e., the date that determines who is eligible to vote, after the trading stage. This sequence of events applies to all votes on

¹³The purpose of this tie-breaking rule is to exclude equilibria that exist only in knife-edge cases. However, as the proof of Proposition 3 shows, other tie-breaking rules also eliminate these knife-edge equilibria — for example, rules under which indifferent shareholders always sell or always buy shares.

¹⁴Levit and Malenko (2011) show that voting on non-binding proposals is effectively binding with an endogenously determined voting threshold that depends on the firm's governance characteristics. For binding proposals, there is heterogeneity across firms with respect to the statutory majority requirement used in shareholder voting. While a large fraction of firms use a simple majority rule, many firms still have supermajority voting for issues such as mergers or bylaw and charter amendments, and supermajority requirements are often a subject of debate (see Papadopoulos, 2019, and Maug and Rydqvist, 2009).

important issues such as M&As, proxy fights, special meetings, and high-profile shareholder proposals, which are known well ahead of the record date. If the record date were prior to the trading stage, then shareholders who sell their shares during trading could still vote, and we do not analyze such “empty voting.” We also assume that shareholders observe the signal q after the record date. Examples of such signals include proxy advisors’ recommendations, which are released about one month after the record date on average (see Fig. 1 in [Li, Maug, and Schwartz-Ziv, 2019](#)) as well as managements’ responses to these recommendations. (See Section 7.4 for the analysis of a second round of trade after information is revealed.)

We analyze subgame perfect Nash equilibria in undominated strategies of the induced voting game. The restriction to undominated strategies is common in voting games, which typically impose the equivalent restriction that agents vote as-if-pivotal.¹⁵ This restriction implies that shareholder b votes his shares in favor of the proposal if and only if

$$b + q > 0. \tag{4}$$

For simplicity, we assume that $\bar{b} < \Delta$, which implies that even the most extreme shareholders condition their vote on the signal.

Extensions. Our baseline model makes some simplifying assumptions for tractability and ease of exposition. In Section 7 we relax some of these assumptions to discuss the following extensions: (1) the presence of index investors, who do not trade and only vote; (2) investors’ social concerns, such that proposals have an impact on investors’ welfare irrespective of their ownership in the firm, e.g., for proposals with a social or environmental impact; (3) a second round of trade after the vote; (4) shareholders’ endowment e and their ability to trade x can vary with their bias b . In addition, in Section A.5 of the Online Appendix, we introduce partial sales of endowments by assuming that shareholders cannot sell more than $y < e$ shares. Our main results continue to hold in all these extensions. Finally, we have also analyzed an alternative specification without an upper limit on purchases of shares. Instead, a shareholder’s utility from buying $s \geq -e$ shares is a quadratic function of the shares s traded, which may capture risk aversion or trading frictions that endogenously limit shareholders’ desire to accumulate a large stake.

¹⁵E.g., [Baron and Ferejohn \(1989\)](#) and [Austen-Smith and Banks \(1996\)](#). This restriction helps rule out trivial equilibria, in which shareholders are indifferent between voting for and against since they are never pivotal.

4 Analysis

We solve the model by backward induction. Before analyzing the full model with trading and voting, we first analyze two benchmark cases to build the intuition, one in which shareholders vote but do not trade (Section 4.1) and one in which they trade but do not vote (Section 4.2).

We start by showing that, regardless of trading, proposal approval at the voting stage takes the form of a simple cutoff rule:

Lemma 1. *If the proposal is decided by a shareholder vote, then in any equilibrium, there exists q^* such that the proposal is approved by shareholders if and only if $q > q^*$.*

Intuitively, this result follows because all shareholders, regardless of their biases, value the proposal more if it is more likely to increase value, i.e., if $\theta = 1$ is more likely.

4.1 Voting without trading

To begin, we develop the benchmark case in which shareholders vote but do not trade. Lemma 1 also applies in this case. The shareholder base at the voting stage is characterized by the pre-trade distribution G , and the proposal is approved if and only if a fraction of at least τ of the initial shareholders vote in favor. Since shareholders with a larger bias value the proposal more, it is approved if and only if the $(1 - \tau)$ -th shareholder, who has a bias of $G^{-1}(1 - \tau)$, votes for the proposal. Hence, the cutoff q^* is given by the expression in Proposition 1:

Proposition 1 (voting without trading). *If the proposal is decided by a shareholder vote but shareholders do not trade, there always exists a unique equilibrium. In this equilibrium, the proposal is approved by shareholders if and only if $q > q_{NoTrade}$, where*

$$q_{NoTrade} \equiv -G^{-1}(1 - \tau). \quad (5)$$

Figure 1 illustrates the equilibrium of Proposition 1 and plots the cdf G against the private values (biases) b . The shareholder with bias $b = -q_{NoTrade}$ is the *marginal voter*. The identity of this shareholder is crucial for the decision on the proposal because his vote always coincides with the voting outcome. If $q = q_{NoTrade}$, there are $G(-q_{NoTrade}) = 1 - \tau$ shareholders for whom $b + q < 0$, who vote against (“Reject” region of the figure), and τ shareholders who

vote in favor (“Accept” region). Thus, the marginal voter is the shareholder who is indifferent between accepting and rejecting the proposal if exactly τ shareholders vote to accept it.

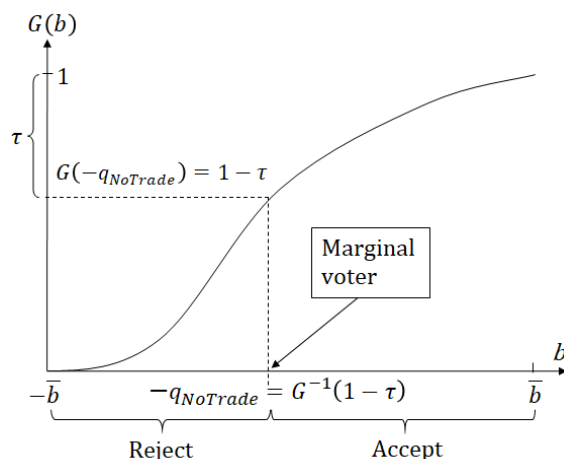


Figure 1 - Equilibrium characterization of the No-trade benchmark

4.2 Trading without voting

In the next step, we consider the second, complementary benchmark case, in which we have trading without voting. In this case, trading occurs as in the general model but then, after the public signal q is revealed, the decision on the proposal is exogenous. For concreteness, and to prepare for our later discussion of delegation in Section 6, we assume that the decision is made by the board of directors. We abstract from collective decision-making within the board and treat it as one single agent who acts like a shareholder with bias $b_m \in [-\bar{b}, \bar{b}]$ and valuation $v(d, \theta, b_m)$, so that it approves the proposal if and only if $b_m + q > 0$. Motivated by Lemma 1, we cast the following discussion in terms of a general exogenous decision rule q^* ; for the decision rule of the board we have $q^* = -b_m$.

Denote by $v(b, q^*)$ the valuation of a shareholder with bias b prior to the realization of q , as a function of the cutoff q^* . Then

$$v(b, q^*) = \mathbb{E}[v(\mathbf{1}_{q > q^*}, \theta, b)], \quad (6)$$

where the indicator function $\mathbf{1}_{q > q^*}$ obtains a value of one if $q > q^*$ and zero otherwise, and

$v(d, \theta, b)$ is defined by (1). Notice that $v(b, q^*)$ can be rewritten as

$$v(b, q^*) = v_0 + b(H(q^*) - \phi) + H(q^*) \mathbb{E}[\theta | q > q^*], \quad (7)$$

and that it increases in b if and only if the probability of proposal approval, $H(q^*) = \Pr[q > q^*]$, is greater than ϕ . In words, activist shareholders with a large bias toward the proposal value the firm more than conservative shareholders with a small bias if and only if the proposal is sufficiently likely to be approved. At the trading stage, the shareholder optimally buys x shares if his valuation exceeds the market price, $v(b, q^*) > p$, sells his endowment of e shares if $v(b, q^*) < p$, and does not trade otherwise. These observations lead to the following result.

Proposition 2 (trading without voting). *There always exists a unique equilibrium of the game in which the proposal is decided by a board with decision rule q^* .*

- (i) *If $H(q^*) > \phi$, the equilibrium is “**activist**.” a shareholder with bias b buys x shares if $b > b_a$ and sells his entire endowment e if $b < b_a$, where*

$$b_a \equiv G^{-1}(\delta). \quad (8)$$

The share price is given by $p = v(b_a, q^)$.*

- (ii) *If $H(q^*) < \phi$, the equilibrium is “**conservative**.” a shareholder with bias b buys x shares if $b < b_c$ and sells his entire endowment e if $b > b_c$, where*

$$b_c \equiv G^{-1}(1 - \delta). \quad (9)$$

The share price is given by $p = v(b_c, q^)$.*

- (iii) *If $H(q^*) = \phi$, no shareholder trades, and the price is $p = v_0 + \phi \mathbb{E}[\theta | q > q^*]$.*

In equilibrium, the firm is always owned by investors who value it most, which gives rise to two different types of equilibria. In part (i) of Proposition 2, the proposal is approved with a relatively high probability, $H(q^*) > \phi$, so activist shareholders value the firm more than conservatives. Hence, the equilibrium is “activist” in the sense that activist shareholders

buy shares from conservatives, and the post-trade shareholder base has a high preference b for the proposal. In part (ii), the proposal is approved with a relatively low probability. Hence, the equilibrium is “conservative” in the sense that conservative shareholders buy from activists, creating a post-trade shareholder base that has a low preference b for the proposal. Overall, trading allows matching between firms and shareholders: Shareholders who like the firm’s policies end up holding the firm, while other shareholders sell, so that the post-trade shareholder base becomes more homogeneous.

Parameter ϕ determines how high the likelihood of proposal approval must be for activists or for conservatives to have the highest valuation. For example, if $\phi \approx \frac{1}{2}$, such as for a proposal that would change the investment strategy from long-term to short-term, then short-term (long-term) shareholders have the highest valuation if and only if the likelihood of proposal approval is high (low) enough. In contrast, if $\phi \approx 0$, such as in a vote for a new project when assets in place are valued equally by all shareholders, then shareholders who favor the project (i.e., activists) have the highest valuation for any positive probability that the project is adopted.

In the activist (conservative) equilibrium, the market-clearing condition determines the “marginal trader” with bias b_a (b_c). For example, in the activist equilibrium, the $1 - G(b_a)$ more activist shareholders with $b > b_a$ buy x shares each; the $G(b_a)$ more conservative shareholders with $b < b_a$ sell e shares each; and the marginal trader b_a is indifferent between buying and selling given the market price. Hence, market clearing requires $x(1 - G(b_a)) = eG(b_a)$, or $G(b_a) = \delta$ from (2), which gives the marginal trader b_a as in (8). The equilibrium share price $p = v(b_a, q^*)$ is determined by the identity of the marginal trader and equals his valuation of the firm, which depends on the decision rule q^* . Any investor with $b \neq b_a$ values the firm differently from the marginal trader, so his valuation is either higher or lower than the market price, creating gains from trade. This equilibrium is illustrated in the left panel of Figure 2. The conservative equilibrium is derived similarly and is displayed in the right panel. In what follows, we ignore the knife-edge case (iii), in which $H(q^*) = \phi$ and no shareholder trades.¹⁶

The identity of the marginal trader depends on liquidity, as summarized in the next result.

Corollary 1. *The marginal trader becomes more extreme when liquidity is higher, i.e., b_a increases in δ and b_c decreases in δ . In addition, $b_c < b_a$ if and only if $\delta > 0.5$.*

¹⁶In Section 4.3 we show that when trade is allowed, this knife-edge equilibrium does not exist.

Corollary 1 follows directly from expressions (8) and (9). To see the intuition, notice that when liquidity δ is high, shareholders with the strongest preference for the likely outcome, i.e., those with a large bias in the activist equilibrium and those with a small bias in the conservative equilibrium, have the highest willingness to pay and buy the maximum number of shares. We sometimes refer to these shareholders as “extremists.” Other shareholders with more moderate views (i.e., $b \in (b_c, b_a)$), take advantage of this opportunity and sell their shares to shareholders with extreme views. In the limit, when there are no trading frictions ($\delta \rightarrow 1$), the firm is held by a single type of shareholder (\bar{b} or $-\bar{b}$). In contrast, when liquidity is low, only shareholders with the most extreme view *against* the likely outcome find it beneficial to sell their shares at a low price, while moderate shareholders (i.e., $b \in (b_a, b_c)$) always buy shares. This explains why the marginal trader in an activist equilibrium is more activist than in the conservative equilibrium if and only if liquidity is sufficiently high ($\delta > 0.5$).

Overall, if liquidity is high, the post-trade ownership structure is dominated by extremists, who can translate their strong views on the proposal into large positions in the firm. In contrast, when liquidity is low, the post-trade shareholder base is relatively moderate and closer to the initial shareholder base. Below we show that this feature has significant implications for prices and welfare when the decision on the proposal is made by a shareholder vote.

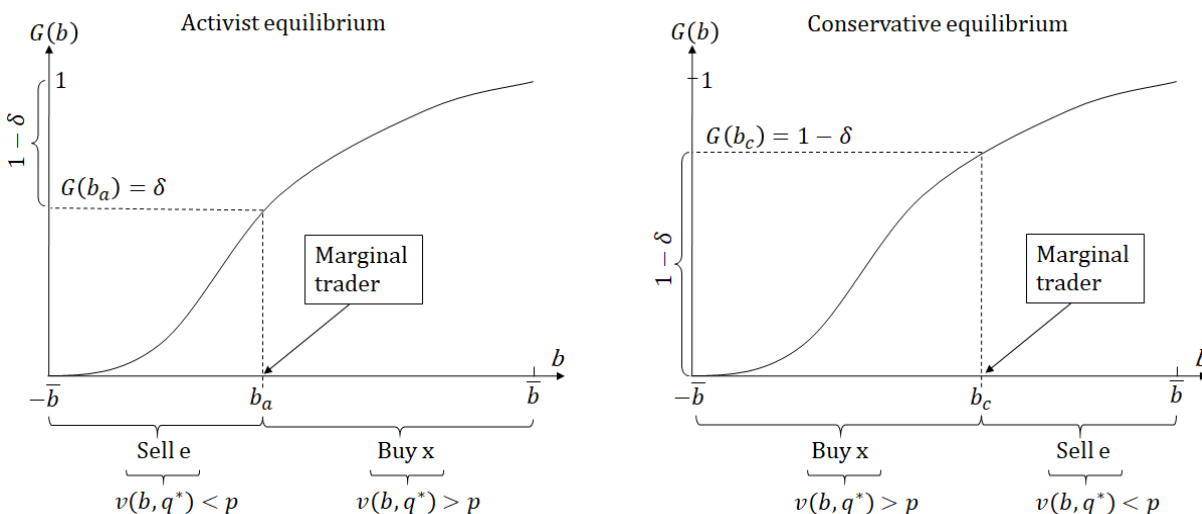


Figure 2 - Equilibrium characterization of the No-vote benchmark

4.3 Equilibrium with trading and voting

We now analyze the general model, in which shareholders trade their shares, and those who own the shares after the trading stage vote those shares at the voting stage. In Section 4.3.1, we characterize the equilibria and discuss their properties. Then, in Section 4.3.2, we discuss the complementarity between trading and voting and derive the circumstances under which multiple equilibria exist.

4.3.1 Existence and characterization of equilibria

According to Lemma 1, the decision rule on the proposal takes the form of an endogenous cutoff q^* , and the proposal is approved if and only if $q > q^*$, i.e., with probability $H(q^*)$. The value of the firm for shareholder b as a function of q^* is again given by (7). As in the no-vote benchmark, $v(b, q^*)$ is increasing in b if and only if $H(q^*) > \phi$. At the trading stage, a shareholder with bias b buys x shares if $v(b, q^*) > p$, sells his endowment of e shares if $v(b, q^*) < p$, and does not trade otherwise. However, differently from the no-vote benchmark, the decision rule is now tightly linked to the trading outcome. In particular, the trading stage determines the composition of the shareholder base at the voting stage, which, in turn, determines the cutoff q^* and the probability that the proposal is approved. Therefore, there is a feedback loop between trading and voting: Shareholders' trading decisions depend on expected voting outcomes, and voting outcomes depend on how trading changes the shareholder base. The next result fully characterizes the equilibria of the game.

Proposition 3 (trading and voting). *An equilibrium of the game with trading and voting always exists.*

(i) *An **activist** equilibrium exists if and only if $H(q_a) > \phi$, where*

$$q_a \equiv -G^{-1}(1 - \tau(1 - \delta)). \quad (10)$$

In this equilibrium, a shareholder with bias b buys x shares if $b > b_a$ and sells his entire endowment e if $b < b_a$, where $b_a \equiv G^{-1}(\delta)$. The proposal is accepted if and only if $q > q_a$, and the share price is given by $p_a = v(b_a, q_a)$.

(ii) A **conservative** equilibrium exists if and only if $H(q_c) < \phi$, where

$$q_c \equiv -G^{-1}((1 - \delta)(1 - \tau)). \quad (11)$$

In this equilibrium, a shareholder with bias b buys x shares if $b < b_c$ and sells his entire endowment e if $b > b_c$, where $b_c = G^{-1}(1 - \delta)$. The proposal is accepted if and only if $q > q_c$, and the share price is given by $p_c = v(b_c, q_c)$.

(iii) Other equilibria do not exist.

Note that $q_c > q_a$: the cutoff for accepting the proposal is higher in the conservative equilibrium than in the activist equilibrium. Accordingly, the probability of accepting the proposal is higher in the activist equilibrium, i.e., $H(q_a) > H(q_c)$. Figure 3 illustrates both equilibria and combines the respective elements from Figures 1 and 2.

The logic behind both equilibria is the same as in the no-vote benchmark in Proposition 2. In the activist equilibrium displayed in the left panel of Figure 3, the cutoff q_a is relatively low ($-q_a$, the bias of the marginal voter, is high) and the proposal is likely to be approved. Hence, the term $H(q_a) - \phi$ in (7) is positive, so conservative shareholders who are biased against the proposal, $b < b_a$, sell their endowment to shareholders who are biased toward the proposal, $b > b_a$. The marginal trader b_a is determined by the exact same market clearing condition described in Proposition 2. Hence, $1 - G(b_a) = 1 - \delta$ shareholders own the firm after trading, and of these, at least $\tau(1 - \delta)$ need to approve the proposal to satisfy the majority requirement, so that $1 - G(-q_a)$ shareholders vote in favor, with q_a defined by (10). Importantly, and differently from the no-vote benchmark, the cutoff q_a is now *endogenously* low: the fact that the post-trade shareholder base consists of shareholders who are biased toward the proposal, $b > b_a$, implies that the post-trade shareholders will optimally vote in favor of the proposal unless their expectation q is sufficiently low to offset their bias. Hence, the expectations about the high likelihood of proposal approval become self-fulfilling. The conservative equilibrium displayed in the right panel of Figure 3 is constructed similarly.

Figure 3 also illustrates that the marginal voter is always more extreme than the marginal trader, i.e., in the activist (conservative) equilibrium, the marginal voter is more activist (conservative) than the marginal trader: $-q_a > b_a$ ($-q_c < b_c$). These relationships follow from Proposition 3 and play an important role in the analysis of welfare and prices in Section 5.

Similar to Lemma 1, the marginal trader becomes more extreme as liquidity increases. In addition, (10) and (11) imply that the marginal voter also becomes more extreme: $-q_a$ ($-q_c$) increases (decreases) in δ . The extreme to which the marginal trader and the marginal voter converge as liquidity increases depends on the type of equilibrium:

Corollary 2. *The marginal voter becomes more extreme as liquidity increases. In the activist (conservative) equilibrium, $-q_a$ increases in δ , and both $-q_a$ and b_a converge to \bar{b} as $\delta \rightarrow 1$ ($-q_c$ decreases in δ , and both $-q_c$ and b_c converge to $-\bar{b}$ as $\delta \rightarrow 1$).*

Intuitively, when liquidity is high, the post-trade shareholder base is dominated by extremists, and their more extreme preferences push the firm's decision-making to the extreme. Therefore, our analysis uncovers a new effect of liquidity on governance through voice.

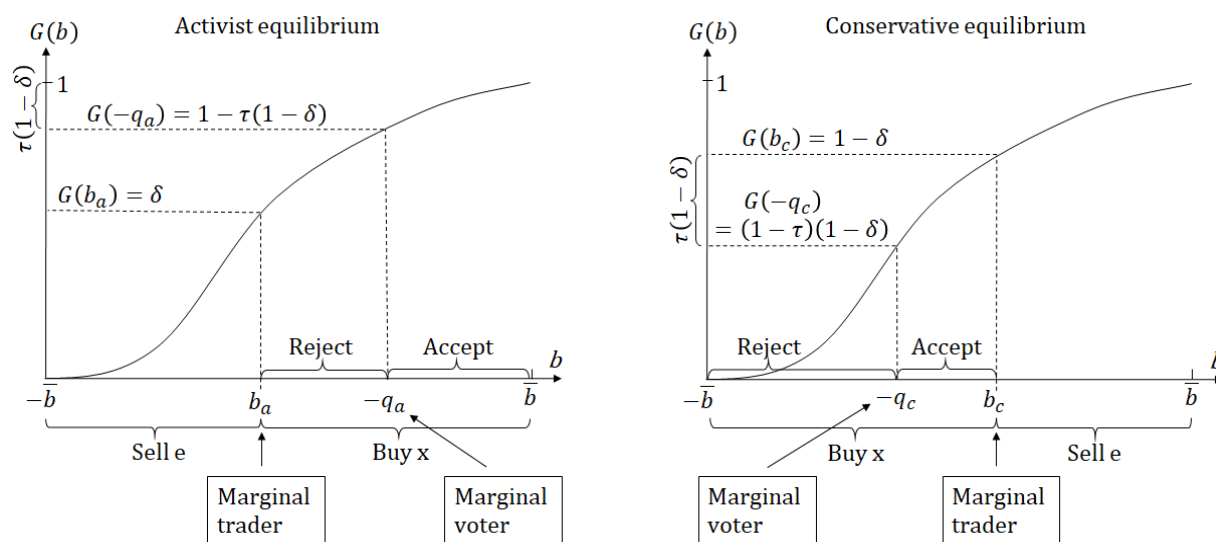


Figure 3 - Equilibrium characterization of the model with trading and voting

4.3.2 Multiple equilibria

As the above discussion shows, the introduction of voting creates self-fulfilling expectations: Shareholders with a preference for the expected outcome buy shares, which in turn makes their preferred outcome more likely. The presence of self-fulfilling expectations suggests that the two

equilibria—conservative and activist—can coexist. Indeed, according to Proposition 3, both equilibria exist whenever

$$H(q_c) < \phi < H(q_a). \quad (12)$$

Classic examples of multiple equilibrium models in financial economics include [Diamond and Dybvig \(1983\)](#) on bank runs, [Calvo \(1988\)](#) on debt repudiation, and [Obstfeld \(1996\)](#) on currency crises. Unlike these models, in which different equilibria (e.g., with vs. without a bank run) have different properties and policy implications, the activist and conservative equilibria in our model are mirror images of each other and have similar policy implications.

The multiplicity of equilibria can be interpreted as an additional source of volatility: If agents change expectations for exogenous reasons and, accordingly, coordinate on a different equilibrium, then prices and voting outcomes may change without any change in the fundamentals of the firm. We thus treat multiple equilibria as a source of non-fundamental indeterminacy: The same proposal voted on at two firms with similar characteristics and fundamentals could have very different voting outcomes and valuation effects. This indeterminacy underscores potential empirical challenges in analyzing shareholder voting and could explain the mixed evidence about the effect of voting on proposals on shareholder value.¹⁷ The next result highlights the factors that contribute to the multiplicity of equilibria.

Proposition 4. *The conservative and the activist equilibria coexist if the market is liquid (sufficiently high δ); if the voting requirement is in an intermediate interval, $\tau \in (\underline{\tau}, \bar{\tau})$; if the expected voting outcome is critical for whether activist or conservative shareholders value the firm more, $\phi \in (H(q_c), H(q_a))$; and only if the heterogeneity of the initial shareholder base, \bar{b} , is not too small.*

Intuitively, the multiplicity of equilibria arises from the possibility that expectations become self-fulfilling. If liquidity δ is large, then the firm experiences large shifts in the shareholder base, and the direction of these shifts depends on the expected proposal outcome, so the interval in (12) in which the two equilibria coexist expands. Multiple equilibria are also less likely if the governance structure requires either very large or very small majorities to approve a decision:

¹⁷[Karpoff \(2001\)](#) surveys the earlier literature, and [Yermack \(2010\)](#) and [Ferri and Göx \(2018\)](#) review some of the later studies. [Cumat, Gine, and Guadalupe \(2012\)](#) also summarize that “(...) the range of results in the existing literature varies widely, from negative effects of increased shareholder rights (...) to very large and positive effects on firm performance (...)” (pp. 1943-44).

then, an activist (conservative) equilibrium is unlikely to exist because approval (rejection) of the proposal requires almost all shareholders to vote in its favor (against). Since most firms have simple majority voting rules, the non-fundamental indeterminacy we point out seems important. Multiple equilibria are also less likely for extreme values of ϕ . As discussed above, intermediate values of ϕ correspond to cases when shareholders choose between policies that are in conflict, such as long-term and short-term investment policies. Then the likelihood of proposal approval becomes critical for whether activists or conservatives value the firm more. Finally, the heterogeneity among shareholders cannot be too small; otherwise, there are not enough shareholders with extreme views who can give rise to both types of equilibria.

This non-fundamental indeterminacy raises the question of how shareholders coordinate on a particular equilibrium. There are multiple potential sources in the economic environment that may influence expectation formation about the voting outcome and hence equilibrium selection. For example, some shareholders may be more visible or have better access to the media, putting them into a position to influence the expectations of other shareholders. Proxy advisory firms may perform a similar function and may have an influence on voting outcomes by coordinating shareholders' expectations.

Finally, while the multiplicity of equilibria can be important to interpret empirical evidence about the effects of shareholder voting, it is not important for any of the subsequent results: those results are exactly the same in the region with a unique equilibrium.

5 Shareholder welfare and prices

In this section we analyze the price and welfare effects of trading and voting. We start by deriving general properties that form the basis for our discussion. Then, in Section 5.1, we show that shareholder welfare and prices can move in opposite directions in response to changes in parameters, and in Section 5.2, we show that in the presence of voting, the ability to trade can be detrimental to shareholder welfare.

The equilibrium share price is characterized by Proposition 3, which shows that the price depends on the identities of the marginal voter and the marginal trader, $p_a = v(b_a, q_a)$ and $p_c = v(b_c, q_c)$. The marginal voter determines the firm's decision rule regarding the proposal, and the marginal trader's valuation given this decision rule determines the market price.

We define shareholder welfare as the average expected value of the shares by the *initial* (pre-trade) shareholder base. As we show next, the expected value of initial shareholders equals the valuation of the average shareholder who holds shares after trading. Specifically, in the activist equilibrium, whenever it exists, the expected value of initial shareholders is

$$W_a = ep_a \Pr [b < b_a] + \mathbb{E} [(e + x) v (b, q_a) - xp_a | b > b_a] \Pr [b > b_a]. \quad (13)$$

Similarly, in the conservative equilibrium, the expected value of initial shareholders is

$$W_c = ep_c \Pr [b > b_c] + \mathbb{E} [(e + x) v (b, q_c) - xp_c | b < b_c] \Pr [b < b_c]. \quad (14)$$

In both expressions, the first term captures the value of shareholders who sell their endowment e in equilibrium, whereas the second term is the expected value of shareholders who buy shares in equilibrium: it equals the value of their post-trade stake in the firm minus the price paid for the additional shares acquired through trading. To simplify the notation, we define

$$\beta_a \equiv \mathbb{E} [b | b > b_a] \text{ and } \beta_c \equiv \mathbb{E} [b | b < b_c], \quad (15)$$

which denotes the average bias of the post-trade shareholder base for, respectively, the activist and the conservative equilibrium. The average bias of the post-trade shareholder base plays a critical role in the following welfare analysis. Indeed, while the share price is determined by the valuation of the *marginal* trader, the next result shows that shareholder welfare is determined by the valuation of the *average* post-trade shareholder.

Lemma 2. *In any equilibrium, the expected welfare of the pre-trade shareholder base is equal to the valuation of the average post-trade shareholder. In particular,*

$$W_a = e \cdot v (\beta_a, q_a) \text{ and } W_c = e \cdot v (\beta_c, q_c). \quad (16)$$

Intuitively, market clearing implies that all the gains of the shareholders who sell shares are offset by the losses of the shareholders who buy shares. Since selling shareholders sell their entire endowment, their valuations are fully captured by the transfers from buying shareholders. Thus, the expected welfare of the pre-trade shareholder base equals the expected

welfare of the shareholder base post-trade, i.e., $\mathbb{E}[v(b, q_a) | b > b_a]$ in the activist equilibrium and $\mathbb{E}[v(b, q_c) | b < b_c]$ in the conservative equilibrium. The linearity of $v(b, q^*)$ in b in turn implies that the expected welfare of the shareholder base post-trade is equal to the valuation of the average post-trade shareholder.

Before deriving the main results of this section, we analyze the conditions under which the expected shareholder welfare and the share price are maximized. For this purpose, we consider the following thought experiment: Holding everything else equal, when does $v(b, q^*)$ obtain its maximum as a function of the marginal voter's bias $-q^*$? Expression (7) implies

$$\frac{\partial v(b, q^*)}{\partial q^*} > 0 \Leftrightarrow -q^* > b. \quad (17)$$

Therefore, the valuation $v(b, q^*)$ of a shareholder with bias b is maximized if $-q^* = b$, i.e., if the choice of the shareholder coincides with that of the marginal voter.

Since in the activist equilibrium $p_a = v(b_a, q_a)$ and $W_a = e \cdot v(\beta_a, q_a)$, and in the conservative equilibrium $p_c = v(b_c, q_c)$ and $W_c = e \cdot v(\beta_c, q_c)$, this insight gives the following result, which plays a central role in the analysis below.

Lemma 3.

- (i) *The share price obtains its maximum when the bias of the marginal voter equals the bias of the marginal trader (b_a in the activist equilibrium and b_c in the conservative equilibrium).*
- (ii) *Shareholder welfare obtains its maximum when the bias of the marginal voter equals the bias of the average post-trade shareholder (β_a in the activist equilibrium and β_c in the conservative equilibrium).*

By implication, the share price increases (decreases) if the marginal voter moves toward (away from) the position of the marginal trader. Similarly, shareholder welfare increases (decreases) if the marginal voter moves toward (away from) the position of the average post-trade shareholder. In what follows, we use these insights to explore the welfare and price effects.¹⁸

¹⁸In an empirical study of proxy contests, Listokin (2009) also observes the difference between the valuations of marginal traders, who set prices, and marginal voters, who determine voting outcomes, and concludes that marginal voters value management control more than marginal traders in his sample.

5.1 Opposing effects on shareholder welfare and prices

The literature in financial economics often draws a parallel between shareholder welfare and prices and uses stock returns to approximate effects on shareholder welfare. This parallel is natural if shareholders have homogeneous preferences. The next result highlights that if shareholders have heterogeneous preferences, shareholder welfare and prices may in fact move in opposite directions in response to exogenous changes to the firm's governance structure or trading environment.

Proposition 5. *Suppose the marginal voter is less extreme than the average post-trade shareholder (i.e., $-q_a < \beta_a$ in the activist equilibrium and $-q_c > \beta_c$ in the conservative equilibrium), and consider a small exogenous change in parameters that affects the position of the marginal voter without affecting the marginal trader or the average post-trade shareholder. Then, if such a change in parameters increases (decreases) the share price, it also necessarily decreases (increases) shareholder welfare.*

A change to the majority requirement τ is an example of a parameter change in our setting that affects the marginal voter without affecting the marginal trader or the average post-trade shareholder. Indeed, based on (10) and (11), an increase in τ makes the marginal voter more conservative (i.e., $-q_a$ and $-q_c$ decrease) because it requires more conservative shareholders to vote for the proposal in order for it to be approved. At the same time, τ has no effect on the marginal trader (b_a and b_c), and hence, on the average post-trade shareholder (β_a and β_c). The next corollary follows directly from Proposition 5.

Corollary 3. *Suppose the marginal voter is less extreme than the average post-trade shareholder. Then, a small change in the majority requirement τ that increases (decreases) the share price, necessarily decreases (increases) shareholder welfare.*

The intuition for Proposition 5 and Corollary 3 is explained with the help of Figure 4, which focuses on the activist equilibrium.

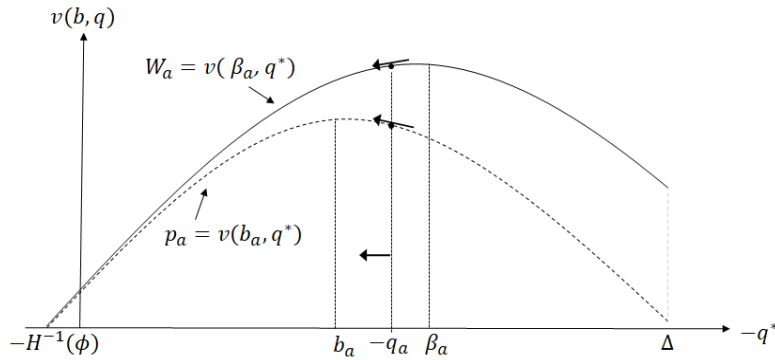


Figure 4 - Opposing effects on shareholder welfare and prices in the activist equilibrium

Recall that, for any given decision rule q^* , the share price equals the valuation of the marginal trader, $p_a = v(b_a, q^*)$, and shareholder welfare is the valuation of the average post-trade shareholder, $W_a = v(\beta_a, q^*)$. Both functions are displayed in Figure 4. Shareholder welfare is maximized if the decision rule equals that of the average post-trade shareholder $-\beta_a$, whereas prices are maximized if the decision rule equals that of the marginal trader $-b_a$. The marginal trader is the most conservative among all post-trade shareholders and benefits from an increase in τ since a stricter majority requirement makes the marginal voter more conservative and moves him closer to the marginal trader. This effect increases the stock price. However, if the marginal voter is more conservative than the average shareholder, then any increase in τ moves the marginal voter even further away from the average shareholder, which decreases welfare. Hence, if the marginal voter is located between the marginal trader and the average post-trade shareholder, then any change of the marginal voter either moves him closer to the marginal trader but farther from the average shareholder (the scenario described in Figure 4), or the opposite, so prices and shareholder welfare move in opposite directions.

The opposing price and welfare effects are not unique to changes in the majority requirement: for example, in Sections 7.1 and 7.2, we show that prices and shareholder welfare could react in opposite directions to changes in index investor ownership and the social concerns of shareholders, respectively. Moreover, in Section 7.4, we analyze an extension with an additional round of trade post-voting, and show that the logic above also implies that price and welfare reactions to voting outcomes can have opposite signs.

Overall, Proposition 5 highlights a potential limitation to prices as a measure of shareholder welfare in the context of shareholder voting. By using prices as a proxy for shareholder welfare, the researcher may sometimes not only obtain a biased estimate of the real effect of the proposal, but even get the wrong sign of the effect. In Section 8, we discuss the conditions under which the discrepancy between prices and shareholder welfare is less likely to exist.

5.2 Liquidity and shareholder welfare

In this section, we show that greater opportunities to trade and higher liquidity can be detrimental to shareholder welfare. To see this, recall that shareholder welfare equals the valuation of the average post-trade shareholder and depends on the identity of the marginal voter; e.g., $W_a = v(\beta_a, q_a)$ in the activist equilibrium. Higher liquidity creates two opposing effects. The first, and positive effect is that it enables shareholders with different preferences to exchange more shares and realize larger gains from trade, so that post-trade ownership is concentrated among the more extreme shareholders, who value the firm the most (β_a increases). We can isolate this effect by focusing on the case when decisions are made by a board with an exogenous decision rule q^* , as in the no-vote benchmark in Section 4.2:

Lemma 4. *When the proposal is decided by a board with decision rule q^* , shareholder welfare always increases with liquidity δ .*

However, when decisions are made by a shareholder vote, liquidity has a second effect. Concentrating post-trade ownership among the more extreme shareholders makes the marginal voter $-q_a$ more extreme, which is detrimental to welfare if the average shareholder is more moderate than him (i.e., if $\beta_a < -q_a$, then $v(\beta_a, q_a)$ decreases as $-q_a$ increases).

Whether the combined effect of these two forces is positive or negative depends on whether the wedge between the average shareholder and the marginal voter narrows or widens as they become more extreme. The next result shows that there are conditions under which this wedge widens and liquidity is detrimental to shareholder welfare:

Proposition 6. *Suppose the proposal is decided by a shareholder vote and the marginal voter in the no-trade benchmark is more extreme than the average shareholder. If $|H(q_{NoTrade}) - \phi|$ is sufficiently small, there exists $\underline{\delta} > 0$ such that shareholder welfare decreases with δ for $\delta < \underline{\delta}$.*

The wedge between the average post-trade shareholder and the marginal voter widens if the marginal voter is already more extreme than the average shareholder, and becomes more extreme at a faster rate as liquidity increases. The term $|H(q_{NoTrade}) - \phi|$ measures the sensitivity of a shareholder's valuation to his bias, and if this sensitivity is small, the average shareholder's valuation does not increase much with δ . The reason δ cannot be too large is that then, both the marginal voter and the average shareholder converge to the most extreme shareholder, so the wedge between them shrinks to zero and welfare increases with δ .

Proposition 6 reveals a new force through which financial markets have real effects. In our setting, financial markets do not aggregate or transmit investors' information to decision-makers. Instead, they allow extreme shareholders to accumulate large positions and then use their votes to implement their preferred decisions. This effect can be detrimental to ex-ante shareholder value, both to shareholders who buy shares and to those who sell. Intuitively, if more trade makes the marginal voter too extreme, then even shareholders who buy shares are worse off if their bias is moderate. Since the willingness to pay of these shareholders decreases, the price at which other shareholders can sell their shares decreases as well. Thus, both shareholders who sell and the moderate shareholders who buy may be worse off if δ is higher. Only the most extreme shareholders are always better off if δ increases. In the proof of Proposition 6, we show that a similar logic may lead the share price to decrease with liquidity.

6 Delegation

The analysis in Section 5.2 shows that shareholder voting generates an externality if shareholders can trade before they vote, with potentially negative implications for aggregate shareholder welfare. In Section 6.1, we ask whether shareholders would be better off if decisions were instead delegated to the board of directors. Thus, we return to the question we raised in the Introduction, i.e., whether shareholder democracy dominates board primacy for corporate decision-making. In Section 6.2, we ask whether the majority of shareholders would support the delegation of authority to the board.

6.1 Optimal board

We return to the game from Section 4.2 in which the decision is made unilaterally by a board of directors with bias b_m and decision rule $q^* = -b_m$, which reflects the incentives and preferences of board members. We are interested in the effect of b_m on shareholder welfare.

As shown in Proposition 2, the equilibrium is unique and either activist, if the board is biased toward the proposal, or conservative, if it is biased against the proposal. We refer to such boards as “activist” or “conservative,” respectively. We call the board optimal if it maximizes shareholder welfare, which is defined as the expected average valuation of the initial shareholders. Lemma 2 holds in this context as well, so the welfare of the initial shareholders equals the welfare of the post-trade shareholders and is given by

$$W_{m,a} = e \cdot v(\beta_a, -b_m) \text{ and } W_{m,c} = e \cdot v(\beta_c, -b_m) \quad (18)$$

if the board is activist and conservative, respectively. The next result characterizes the bias of the optimal board and compares welfare under delegation to welfare under shareholder voting.

Proposition 7.

- (i) *If $v(\beta_a, -\beta_a) > v(\beta_c, -\beta_c)$, then the optimal board is activist and $b_m^* = \beta_a$; otherwise, the optimal board is conservative and $b_m^* = \beta_c$.*
- (ii) *The optimal board is always biased. If it is activist (conservative), then $b_m^* > \mathbb{E}[b]$ ($b_m^* < \mathbb{E}[b]$).*
- (iii) *There always exists an $\varepsilon > 0$, such that if $|b_m - b_m^*| < \varepsilon$, the induced delegation equilibrium generates strictly higher shareholder welfare than any voting equilibrium, unless the voting equilibrium happens to be optimal already (i.e., either $-q_a = b_m^*$ or $-q_c = b_m^*$).*

An important implication of Proposition 7 is that it is optimal to have a biased board. According to part (ii), the optimal board is always either more conservative or more activist relative to the initial shareholder base, i.e., $b_m^* \neq \mathbb{E}[b]$, even though it maximizes the welfare of the initial shareholders. Intuitively, the aggregate welfare of the initial shareholders equals the aggregate welfare of post-trade shareholders, which, in turn, is maximized by a biased board:

From Lemma 3, the bias of the optimal board equals the average bias of *post-trade* shareholders (β_a or β_c). By catering to the preferences of these more extreme shareholders with a higher willingness to pay, such a board also benefits shareholders with more moderate views who sell their shares, since they can now sell for a higher price. Our prior analysis also implies that the optimal board is tightly linked to the firm's trading environment: as liquidity δ increases, the post-trade shareholder base becomes more extreme, so the optimal board becomes more biased. The optimal board is unbiased only if there is no trading between shareholders, i.e., $b_m^* \rightarrow \mathbb{E}[b]$ as $\delta \rightarrow 0$. Note also that since $\beta_a \neq b_a$ ($\beta_c \neq b_c$) and prices are determined by the valuation of the marginal trader, the objective of the optimal board should not be to maximize the share price. Overall, it is optimal to have a board that is aligned with investors whose willingness to pay is higher than average.

In part (iii), we compare decision-making via shareholder voting, which results in decision rule q_a or q_c , to decision-making by the board. Note that a board with bias $b_m = -q_a$ ($b_m = -q_c$) implements the outcome of the activist (conservative) voting equilibrium. Thus, shareholders cannot be worse off with an optimally chosen board than with a shareholder vote. Moreover, shareholders are strictly better off with an optimal board even though this optimal board is biased, except for knife-edge cases in which the voting equilibrium yields the highest welfare. In all other cases, the board does not have to be optimal, but just has to be good enough in the sense of being close to b_m^* to increase welfare relative to decision-making via voting.

Overall, the key conclusion of Proposition 7 is that delegating authority to a *biased* board can be optimal and dominate shareholder voting. In other words, the common argument that if the board is biased, decisions should be delegated to shareholders, is not always correct if shareholder trading is taken into account.

6.2 Voting to delegate to a board

Due to shareholder heterogeneity, even the optimal board, which maximizes the aggregate shareholder welfare, may nevertheless harm some of them. Those shareholders may prefer to retain their voting rights. This raises the question whether the majority of the initial shareholders would give up their right to vote and leave the choice to the board that improves aggregate welfare. In other words, can we expect shareholders to reach a consensus on delegation?

To answer this question, we analyze the following extension. Suppose that at the outset of the game, before the trading stage, shareholders choose between two alternatives: (i) all shareholders retain their voting rights, as in the baseline model; and (ii) shareholders delegate decision-making authority to a board with an exogenously given bias b_m , which then decides on the proposal. Decision-making is delegated to the board if and only if a fraction of at least τ of the shareholders support delegation.

In Proposition 8 in the Appendix we show that the optimal board, as characterized by Proposition 7, cannot always garner support from at least τ of the initial shareholders. The main reason behind this coordination failure are short-term trading considerations that distort shareholder votes on board delegation. To understand the intuition, consider the activist equilibrium and suppose that the marginal voter is more activist than the average post-trade shareholder (i.e., $\beta_a < -q_a$), that is, there are welfare gains from delegating decision rights to a board that is more conservative than the marginal voter. However, notice that in general, shareholders who expect to buy shares ($b > b_a$) would like to reduce the share price p_a . Since the share price is given by the valuation of the marginal trader b_a , shareholders with bias $b > b_a$ have incentives to support boards that the marginal trader dislikes. This consideration amplifies their incentives to support activist boards. Essentially, buying shareholders support boards that are more activist than they are, since they internalize the negative effect that such boards will have on the value of the marginal trader, and thereby, on the price at which they buy. For that reason, even when there are more than τ of the initial shareholders that are more conservative than the marginal voter, they cannot agree to delegate their voting rights to even a marginally more conservative board, and in particular, to the optimal board.

Overall, we show that when voting occurs prior to trading, short-term trading considerations may push shareholders to make suboptimal delegation decisions in order to gain from trading.

7 Extensions and robustness

In this section we discuss several extensions of the model. The complete analysis of these extensions is in the Online Appendix, and we only summarize the key conclusions here.

7.1 Index investors

An important trend in recent decades has been the growth of passively managed index funds: for example, the Big-3 index fund families alone collectively cast about 25% of the votes at S&P 500 firms (Bebchuk and Hirst, 2019). Accordingly, there is an active academic and policy debate about their role for corporate governance.¹⁹ Since index funds do not actively trade but actively vote, our paper provides a natural setting to study their role for shareholder voting.

In Section A.1 of the Online Appendix, we extend the model to two groups of investors: fraction μ are indexers, which do not trade but vote, and fraction $1 - \mu$ are actively trading investors, as in the baseline model. The distribution of biases across both investor groups is the same and given by cdf G . Because the marginal trader is determined by the relative demand and supply of non-index shares, his identity is unaffected by the fraction of index investors. In contrast, since index investors participate in the vote, their presence affects the identity of the marginal voter: As index ownership μ increases, the marginal voter becomes less extreme, i.e., less activist (conservative) in the activist (conservative) equilibrium. Intuitively, while the trading of non-index investors aligns the shareholder base with the expected outcome and makes the marginal voter more extreme, the presence of index investors who do not trade has a moderating effect and makes the marginal voter less extreme. This implies, in particular, that if μ is sufficiently large, the equilibrium is unique, i.e., the presence of index investors mitigates non-fundamental uncertainty.

We show that index ownership has a non-monotonic effect on the share price. Intuitively, in our baseline model, the marginal voter is always more extreme than the marginal trader — e.g., more activist in the activist equilibrium. Since the presence of index investors makes the marginal voter more conservative, it aligns decisions with the marginal trader's preferences and thereby increases the price. However, if index ownership is sufficiently large, the marginal voter becomes even more conservative than the marginal trader, and from that point on, an increase in index ownership widens the gap between them, which decreases the price.

In addition, we reinforce our conclusion about the opposing price and welfare effects. In particular, we show that an increase in index ownership can have a positive effect on the share price but a negative effect on shareholder welfare. Intuitively, if the marginal voter is

¹⁹See, e.g., “Vanguard, Trian and the problem with ‘passive’ index funds”, *Forbes*, Feb 15, 2017; Appel, Gormley, and Keim (2016), Heath et al. (2020).

between the marginal trader and the average post-trade non-index shareholder, an increase in index ownership makes the marginal voter more moderate and thus moves him closer to the marginal trader but farther from the average shareholder.

7.2 Social concerns

Environmental and social (E&S) issues are becoming increasingly important for shareholders and gaining prominence in voting: about 30% of shareholder proposals in recent years are related to E&S issues (Bolton et al., 2019; Bubb and Catan, 2019). If a proposal has environmental or social implications, shareholders may care about it even beyond its impact on the value of their shares. In Section A.2 of the Online Appendix, we analyze a variation of the model that accounts for such preferences: we assume that the preferences of a shareholder with bias b who trades $t \in [-e, x]$ shares and owns $e + t$ shares after trading, are given by

$$(e + t) [v_0 + (\theta + b) (d - \phi)] + \gamma bd. \quad (19)$$

Parameter $\gamma \geq 0$ captures the weight shareholders assign to the proposal beyond their ownership in the firm, and thus measures social concerns. The case $\gamma = 0$ is the baseline model.

The presence of shareholders' social concerns affects the welfare functions W_a and W_c , which now represent the valuation of investors with attitudes $\beta_a + (\gamma/e) \mathbb{E}[b]$ and $\beta_c + (\gamma/e) \mathbb{E}[b]$, respectively. Intuitively, because investors are now affected by the proposal even if they sell their shares, the welfare function must put some weight on $\mathbb{E}[b]$, the average bias of the pre-trade shareholder base. However, and for the same reasons as in the baseline model, we show that our main results extend to this setting (e.g., opposing price and welfare effects, a biased optimal board, and shareholders' collective failure to delegate authority to the optimal board). Interestingly, new insights also emerge from this extension.

Importantly, social concerns amplify shareholders' attitudes to the proposal: A shareholder votes in favor if and only if $q > -b(1 + (\gamma/e)(1 - \delta))$. Hence, conservative shareholders ($b < 0$) become even more conservative in that they apply an even higher hurdle toward accepting the proposal, whereas activist shareholders ($b > 0$) become even more activist. We show that this amplification makes multiple equilibria more likely, since larger social concerns reinforce the self-fulfilling property of voting outcomes. The amplification effect also implies that the share

price can be negatively affected by social concerns: Since investors buy and sell shares in order to maximize their trading profits rather than to affect the voting outcome, social concerns make the marginal voter's preferences even more extreme, but they do not change the identity of the marginal trader. As a result, social concerns widen the gap between the marginal trader and the marginal voter, and thereby decrease the price.

7.3 Heterogeneous endowments and trading frictions

We also extend the baseline model by allowing shareholders to differ with respect to their endowments and their ability to buy shares (see Section A.3 of the Online Appendix for the complete analysis). Specifically, we assume that a shareholder with bias b has an endowment $e(b) > 0$ and can buy up to $x(b) > 0$ shares. We do not restrict the correlations between $x(b)$, $e(b)$, and b in any way. For example, endowments and trading opportunities could be higher for activist shareholders, for conservative shareholders, or for extremist (high- $|b|$) shareholders. We denote the total endowment by $\mathbf{e} \equiv \int_{-\bar{b}}^{\bar{b}} e(b) dG(b)$.

The trading equilibrium is very similar to the baseline case, i.e., there is an activist and a conservative equilibrium. Consider the activist equilibrium. The marginal trader b_a , who is indifferent between buying and selling, is determined by market clearing, i.e., by the unique solution of $\int_{b_a}^b x(b) dG(b) = \int_{-b}^{b_a} e(b) dG(b)$. All shareholders with a bias higher (lower) than that of the marginal trader buy (sell), so post-trading, a shareholder with bias $b > b_a$ holds $x(b) + e(b)$ shares. Thus, we define a new density function and cdf for the distribution of post-trade shareholders as

$$g_a(b) \equiv g(b) \frac{x(b) + e(b)}{\mathbf{e}}, \quad G_a(b) \equiv \int_{b_a}^b g_a(b) db, \quad (20)$$

which allows us to apply the arguments of the baseline model to this extension. In particular, the marginal voter is given by $-q_a = G_a^{-1}(1 - \tau)$ and is more extreme than the marginal trader, i.e., $-q_a > b_a$. The welfare functions have the same characteristics and reflect the welfare of the post-trade shareholders (as in Lemma 2), so our results on the opposing effects on welfare and prices (Proposition 5) and the optimal board (Propositions 7 and 8) continue to hold.

7.4 Second round of trading

The baseline model features one round of trading, which takes place *prior* to the vote and before the public signal is revealed. In a further extension, we introduce a second round of trading *after* the vote. The purpose of this extension is twofold. First, it allows us to analyze the price and welfare reactions to the voting outcome. Second, it shows the robustness of our insights to a dynamic trading environment and in particular, to allowing shareholders to trade after learning the public signal.²⁰ For simplicity, in this discussion, we focus on the case $\phi = 0$, when the equilibrium is activist. The complete analysis of this case and the discussion of cases with $\phi \neq 0$ are in Section A.4 of the Online Appendix.

The pre-vote trading stage is similar to that in the baseline model: conservative shareholders with $b < b_a$ sell to activist shareholders, so the shareholder base at the voting stage consists of shareholders with $b > b_a$, where b_a is given by (8). However, additional trading now takes place after the vote: If the proposal is accepted, the more moderate shareholders among those with $b > b_a$ sell to the more activist shareholders. The anticipation of this post-vote trading implies that the pre-vote share price is the expected post-vote price, i.e., the expected valuation of the post-vote marginal trader. Therefore, the price reaction to proposal approval is positive if and only if proposal approval benefits the post-vote marginal trader.

We next show that the average price and welfare reactions to proposal approval can have opposite signs. The intuition is similar to the intuition for opposing price and welfare effects in Section 5.1. If the marginal voter is more activist (i.e., more extreme) than the post-vote marginal trader, then on average, this marginal trader's valuation and hence the share price react negatively to proposal approval. In contrast, shareholder welfare can on average react positively to proposal approval if the marginal voter is less activist (i.e., less extreme) than the *average* shareholder after the post-vote trading stage. Overall, this extension further supports our conclusion in Section 5.1 that price reactions may be an imperfect proxy for welfare effects of shareholder votes.

²⁰In the Online Appendix, we discuss how the equilibrium of this extension compares to the equilibrium of an alternative game, in which the second round of trading occurs between the public signal and the vote.

8 Implications for empirical research

In this section, we discuss the implications of our analysis for empirical research. One implication of our model is that we should expect large turnover in the shareholder base before shareholder votes, especially for votes on important issues. [Cox, Mondino, and Thomas \(2020\)](#) support this prediction. They find that targets in M&A deals experience substantial ownership changes after the deal is announced, and the extent of these ownership changes is positively associated with the likelihood that the deal later garners shareholder approval. The authors conclude that investors who buy shares prior to the vote would like the deal to go through and thus push for its completion by voting in favor, which is consistent with our model. Similarly, [Li, Maug, and Schwartz-Ziv \(2019\)](#), document a large increase in trading volume before and after shareholder votes. Their finding that shareholders whose vote was opposed to the voting outcome are more likely to reduce their holdings after the vote is also consistent with our predictions when we extend the baseline model to include a second round of trading after the vote (see Section 7.4).

Our observation that shareholder welfare and share prices may move in opposite directions indicates an important limitation to conventional inferences from event studies of shareholder votes (see Section 5.1). Hence, we ask under which conditions this discrepancy between prices and welfare is less likely and, accordingly, when the common interpretation of event studies of voting would be more appropriate. This discrepancy is likely to be smaller if the average post-trade shareholder is closer to the marginal trader, i.e., if the post-trade shareholder base is less heterogeneous. This, in turn, is more likely when the firm's shares are sufficiently liquid: If there are few barriers to trade, the post-trade ownership is more concentrated and homogeneous. Shareholder heterogeneity is also less likely for issues that involve a clear conflict between shareholders and management, rather than issues that typically cause disagreements among shareholders, such as E&S policies (e.g., [Bolton et al., 2019](#)).

Building on the analysis in Section 7.4, we can predict whether prices and welfare are likely to react in the same direction to the approval of a proposal based on the vote tally. Intuitively, overwhelming shareholder support of the proposal implies that both the marginal trader and the average shareholder likely voted in its favor, and hence benefited from its approval. In contrast, approval of the proposal for which the vote was close implies a significant level of shareholder

disagreement, so the marginal and average shareholder are more likely to be affected by this outcome differently. Hence, event study returns are less reliable as indicators of shareholder welfare when voting results are close.

Finally, the multiplicity of equilibria highlighted in Section 4.3.2 implies that similar proposals in similar firms could have very different levels of shareholder support and valuation effects. Since this non-fundamental indeterminacy presents potential challenges in studying shareholder voting, it is worth discussing when it is more or less likely. As follows from the analysis in Sections 4.3.2, 7.1, and 7.2, non-fundamental indeterminacy is less likely in firms that have a large proportion of long-term, non-transient shareholders (e.g., firms with high index fund ownership, or with high insider ownership) and is more likely in firms with liquid shares, which can experience large swings in the shareholder base. Across proposals, non-fundamental indeterminacy is relatively more likely for proposals on environmental and social issues, both because they may affect investors' utility beyond their direct impact on their valuations, and because they can create substantial heterogeneity in investors' preferences.

9 Conclusion

In this paper we study the effectiveness of shareholder voting in a context in which the shareholder base forms endogenously through trading. Specifically, we analyze the relationship between trading and voting in a setting in which shareholders have identical information but heterogeneous preferences. They trade with each other, and those who end up owning the shares vote on a proposal. An important conclusion of our analysis is that when shareholders can trade, shareholder voting may not lead to optimal outcomes. First, shareholders with extreme views can accumulate large positions and use their voting power to implement their preferred policies, which can be detrimental to moderate shareholders and to aggregate shareholder welfare. Second, delegating authority to the board of directors can improve shareholder welfare relative to voting, but short-term trading considerations can prevent shareholders from making the optimal delegation decision. Moreover, the welfare of current shareholders is not maximized with a board that best represents their preferences. Rather, it is maximized by a board that represents the interests of shareholders who own the firm after trading, and thus the optimal board needs to be biased. Hence, observing that the board pursues interests dif-

ferent from those of the average shareholder is not sufficient for making a case for “shareholder democracy” – such a divergence can indeed be optimal. The parallelism to political democracy breaks down in one important respect: Shareholders can trade, and trading aligns the shareholder base with the expected outcomes.²¹

The model in this paper relies on heterogeneous preferences. However, it could be easily modified to accommodate homogeneous preferences if we assume that shareholders have differences of opinions. For example, in such a model, all shareholders may have the same bias but different interpretations of the public signal about the value of the proposal.²² The characterization of the equilibrium would remain similar, but the welfare analysis would require some adjustments, since models with differences of opinions lack objectively correct probability distributions. Exploring such an extension is left for future research.

²¹Easterbrook and Fischel (1983) already pointed out this important difference when they argued that the ability to sell shares serves the same purpose as voting in a polity, which is designed to “elicit the views of the governed and to limit powerful states.” (p. 396). The issue is still debated vigorously in the law literature, see Bebchuk (2005) and Bainbridge (2006).

²²Some papers have explored differences of opinions in relation to corporate governance theoretically (Boot, Gopalan, and Thakor, 2006; Kakhbod et al., 2019) and empirically (Li, Maug, and Schwartz-Ziv, 2019).

References

- Agrawal, Ashwini K. 2012. “Corporate Governance Objectives of Labor Union Shareholders: Evidence from Proxy Voting.” *Review of Financial Studies* 25 (1):187–226.
- Appel, Ian R., Todd A. Gormley, and Donald B. Keim. 2016. “Passive Investors, Not Passive Owners.” *Journal of Financial Economics* 121 (1):111–141.
- Atanassov, Julian. 2013. “Do Hostile Takeovers Stifle Innovation? Evidence from Antitakeover Legislation and Corporate Patenting.” *Journal of Finance* 68 (3):1097–1131.
- Austen-Smith, David and Jeffrey S. Banks. 1996. “Information Aggregation, Rationality, and the Condorcet Jury Theorem.” *American Political Science Review* 90 (1):34–45.
- Bainbridge, Stephen M. 2006. “Director Primacy and Shareholder Disempowerment.” *Harvard Law Review* 119 (6):1735–1758.
- Bar-Isaac, Heski and Joel D. Shapiro. 2019. “Blockholder Voting.” *Journal of Financial Economics* 136 (3):695–717.
- Baron, David P. and John A. Ferejohn. 1989. “Bargaining in Legislatures.” *American Political Science Review* 83 (4):1181–1206.
- Bebchuk, Lucian A. and Scott Hirst. 2019. “The Specter of the Giant Three.” *Boston University Law Review* 99:721–741.
- Bebchuk, Lucian Arye. 2005. “The Case for Increasing Shareholder Power.” *Harvard Law Review* 118 (3):833–914.
- Becht, Marco, Andrea Polo, and Stefano Rossi. 2016. “Does Mandatory Shareholder Voting Prevent Bad Acquisitions?” *Review of Financial Studies* 29 (11):3035–3067.
- Bernhardt, Dan, Tingjun Liu, and Robert Marquez. 2018. “Targeting Target Shareholders.” *Management Science* 64 (4):1489–1509.
- Blair, Douglas H., Devra L. Golbe, and James M. Gerard. 1989. “Unbundling the Voting Rights and Profit Claims of Common Shares.” *Journal of Political Economy* 97 (2):420–443.
- Bolton, Patrick, Tao Li, Enrichetta Ravina, and Howard Rosenthal. 2019. “Investor Ideology.” *Journal of Financial Economics* (forthcoming).
- Bond, Philip, Alex Edmans, and Itay Goldstein. 2012. “The Real Effects of Financial Markets.” *Annual Review of Financial Economics* 4 (1):339–360.
- Boot, Arnoud W. A., Radhakrishnan Gopalan, and Ajan V. Thakor. 2006. “The Entrepreneur’s Choice Between Private and Public Ownership.” *Journal of Finance* 61 (2):803–836.
- Brav, Alon, Amil Dasgupta, and Richmond D. Mathews. 2017. “Wolf Pack Activism.” *ECCI Finance Working Paper* 501/2017.

- Brav, Alon and Richmond D. Mathews. 2011. “Empty Voting and the Efficiency of Corporate Governance.” *Journal of Financial Economics* 99 (2):289–307.
- Bubb, Ryan and Emiliano Catan. 2019. “The Party Structure of Mutual Funds.” *Working Paper*, New York University.
- Burkart, Mike, Denis Gromb, and Fausto Panunzi. 1997. “Large Shareholders, Monitoring, and the Value of the Firm.” *Quarterly Journal of Economics* 112 (3):693–728.
- Burkart, Mike and Samuel Lee. 2008. “The One Share - One Vote Debate: A Theoretical Perspective.” *Review of Finance* 12 (1):1–49.
- Bushee, Brian J. 1998. “The Influence of Institutional Investors on Myopic R&D Investment Behavior.” *The Accounting Review* 73 (3):305–333.
- Calvo, Guillermo A. 1988. “Servicing the Public Debt: The Role of Expectations.” *The American Economic Review* 78 (4):647–661.
- Casella, Alessandra, Aniol Llorente-Saguer, and Thomas R. Palfrey. 2012. “Competitive Equilibrium in Markets for Votes.” *Journal of Political Economy* 120 (4):593–658.
- Chakraborty, Archishman and Bilge Yilmaz. 2017. “Authority, Consensus, and Governance.” *The Review of Financial Studies* 30 (12):4267–4316.
- Cox, James D., Tomas Mondino, and Randall S. Thomas. 2020. “Understanding the (Ir)Relevance of Shareholder Votes on M&A Deals.” *ECGI - Finance Working Paper* (497/2020).
- Cremers, K. J. Martijn and Simone M. Sepe. 2016. “The Shareholder Value of Empowered Boards.” *Stanford Law Review* (1):67–150.
- Cunat, Vicente, Mireia Gine, and Maria Guadalupe. 2012. “The Vote Is Cast: The Effect of Corporate Governance on Shareholder Value.” *Journal of Finance* 67 (5):1943–1977.
- Cvijanovic, Dragana, Amil Dasgupta, and Konstantinos E. Zachariadis. 2016. “Ties That Bind: How Business Connections Affect Mutual Fund Activism.” *The Journal of Finance* 71 (6):2933–2966.
- Cvijanovic, Dragana, Moqi Groen-Xu, and Konstantinos E. Zachariadis. 2020. “Free-Riders and Underdogs: Participation in Corporate Voting.” *ECGI - Finance Working Paper* (649).
- Davis, Gerald F. and E. Han Kim. 2007. “Business Ties and Proxy Voting by Mutual Funds.” *Journal of Financial Economics* 85 (2):552–570.
- DeMarzo, Peter. 1993. “Majority Voting and Corporate Control: The Rule of the Dominant Shareholder.” *Review of Economic Studies* 60 (204):713–734.

- Demichelis, Stefano and Klaus Ritzberger. 2011. “A general equilibrium analysis of corporate control and the stock market.” *Economic Theory* 46 (2):221–254.
- Desai, Mihir A. and Li Jin. 2011. “Institutional tax clienteles and payout policy.” *Journal of Financial Economics* 100 (1):68–84.
- Dhillon, Amrita and Silvia Rossetto. 2015. “Ownership Structure, Voting, and Risk.” *Review of Financial Studies* 28 (2):521–560.
- Diamond, Douglas W. and Philip H. Dybvig. 1983. “Bank Runs, Deposit Insurance, and Liquidity.” *Journal of Political Economy* 91 (3):401–419.
- Drèze, Jacques H. 1985. “(Uncertainty and) The Firm in General Equilibrium Theory.” *The Economic Journal* 95:1–20.
- Easterbrook, Frank H. and Daniel R. Fischel. 1983. “Voting in Corporate Law.” *Journal of Law and Economics* 26 (2):395–427.
- Edmans, Alex. 2014. “Blockholders and Corporate Governance.” *Annual Review of Financial Economics* 6 (1):23–50.
- Edmans, Alex and Clifford G. Holderness. 2017. *Chapter 8 - Blockholders: A Survey of Theory and Evidence*. in: Benjamin E. Hermalin and Michael S. Weisbach, *The Handbook of the Economics of Corporate Governance*, North-Holland, 541–636.
- Edmans, Alex and Gustavo Manso. 2011. “Governance Through Trading and Intervention: A Theory of Multiple Blockholders.” *Review of Financial Studies* 24 (7):2395–2428.
- Esö, Peter, Stephen Hansen, and Lucy White. 2014. “A Theory of Vote-trading and Information Aggregation.” *Working Paper*, University of Oxford.
- Feddersen, Timothy J. and Wolfgang Pesendorfer. 1996. “The Swing Voter’s Curse.” *American Economic Review* 86 (3):408–424.
- Ferri, Fabrizio and Robert F. Göx. 2018. “Executive Compensation, Corporate Governance, and Say on Pay.” *Foundations and Trends in Accounting* 12 (1):1–103.
- Garlappi, Lorenzo, Ron Giammarino, and Ali Lazrak. 2017. “Ambiguity and the Corporation: Group Disagreement and Underinvestment.” *Journal of Financial Economics* 125 (3):417–433.
- . 2019. “The Corporation as a Group: Polarization and Investment Inefficiency.” *Working Paper*, University of British Columbia .
- Gaspar, José-Miguel, Massimo Massa, and Pedro Matos. 2005. “Shareholder Investment Horizons and the Market for Corporate Control.” *Journal of Financial Economics* 76 (1):135–165.

- Gevers, Louis. 1974. *Competitive Equilibrium of the Stock Exchange and Pareto Efficiency*. London: in: Jacques H. Drèze, Allocation under Uncertainty: Equilibrium and Optimality, Proceedings from a workshop sponsored by the International Economic Association, Palgrave Macmillan (UK), 167–191.
- Harris, Milton and Artur Raviv. 2010. “Control of Corporate Decisions: Shareholders vs. Management.” *The Review of Financial Studies* 23 (11):4115–4147.
- Hayden, Grant M and Matthew T Bodie. 2008. “One Share, One Vote and the False Promise of Shareholder Homogeneity.” *Cardozo Law Review* 30:445–505.
- He, Jie, Jiekun Huang, and Shan Zhao. 2019. “Internalizing Governance Externalities: The Role of Institutional Cross-Ownership.” *Journal of Financial Economics* 134 (2):400–418.
- Heath, Davidson, Daniele Macciocchi, Roni Michaely, and Matthew Ringgenberg. 2020. “Passive Investors are Passive Monitors.” *ECGI - Finance Working Paper* (638/2019).
- Hirshleifer, Jack. 1966. “Investment Decision under Uncertainty: Applications of the State-Preference Approach.” *The Quarterly Journal of Economics* 80 (2):252–277.
- Kakhbod, Ali, Uliana Loginova, Andrey Malenko, and Nadya Malenko. 2019. “Advising the Management.” *Working Paper*, Massachusetts Institute of Technology.
- Kalay, Avner and Shagun Pant. 2009. “One Share-One Vote is Unenforceable and Sub-Optimal.” *Working Paper*, Tel Aviv University.
- Karpoff, Jonathan M. 2001. “The Impact of Shareholder Activism on Target Companies: A Survey of Empirical Findings.” *Working Paper*, University of Washington.
- Kelsey, David and Frank Milne. 1996. “The Existence of Equilibrium in Incomplete Markets and the Objective Function of the Firm.” *Journal of Mathematical Economics* 25 (2):229–245.
- Krishna, Vijay and John Morgan. 2011. “Overcoming Ideological Bias in Elections.” *Journal of Political Economy* 119 (2):183–211.
- . 2012. “Voluntary voting: Costs and benefits.” *Journal of Economic Theory* 147 (6):2083–2123.
- Lalley, Steven P. and E. Glen Weyl. 2018. “Quadratic Voting: How Mechanism Design Can Radicalize Democracy.” *American Economic Review, Papers and Proceedings* 108:33–37.
- Levit, Doron and Nadya Malenko. 2011. “Nonbinding Voting for Shareholder Proposals.” *Journal of Finance* 66 (5):1579–1614.
- Li, Sophia Zhengzi, Ernst G. Maug, and Miriam Schwartz-Ziv. 2019. “When Shareholders Disagree: Trading After Shareholder Meetings.” *Working Paper*, Rutgers University.

- Listokin, Yair. 2009. “Corporate Voting versus Market Price Setting.” *American Law and Economics Review* 11 (2):608–635.
- Malenko, Andrey and Nadya Malenko. 2019. “Proxy Advisory Firms: The Economics of Selling Information to Voters.” *Journal of Finance* 74 (5):2441–2490.
- Matvos, Gregor and Michael Ostrovsky. 2010. “Heterogeneity and Peer Effects in Mutual Fund Proxy Voting.” *Journal of Financial Economics* 98 (1):90–112.
- Maug, Ernst and Kristian Rydqvist. 2009. “Do Shareholders Vote Strategically? Voting Behavior, Proposal Screening, and Majority Rules.” *Review of Finance* 13 (1):47–79.
- Meirowitz, Adam and Shaoting Pi. 2020. “The Shareholder’s Dilemma: Voting and Trading.” *Working Paper, University of Utah* .
- Mullins, William and Antoinette Schoar. 2016. “How do CEOs see their Role? Management Philosophy and Styles in Family and Non-Family Firms.” *Journal of Financial Economics* 119 (1):24–43.
- Musto, David and Bilge Yilmaz. 2003. “Trading and Voting.” *Journal of Political Economy* 111 (5):990–1003.
- Neeman, Zvika and Gerhard O. Orosel. 2006. “On the Efficiency of Vote Buying when Voters Have Common Interests.” *International Review of Law and Economics* 26 (4):536–556.
- Noe, Thomas H. 2002. “Investor Activism and Financial Market Structure.” *Review of Financial Studies* 15 (1):289–318.
- Obstfeld, Maurice. 1996. “Models of Currency Crises with Self-fulfilling Features.” *European Economic Review* 40 (3):1037–1047.
- Palfrey, Thomas R. and Howard Rosenthal. 1985. “Voter Participation and Strategic Uncertainty.” *American Political Science Review* 79 (1):62–78.
- Papadopoulos, Kosmas. 2019. “An Overview of Vote Requirements at U.S. Meetings.” Harvard Law School Forum on Corporate Governance and Financial Regulation, July 6, 2019; <https://corpgov.law.harvard.edu/2019/07/06/an-overview-of-vote-requirements-at-u-s-meetings/>.
- Speit, Andre and Paul Voss. 2020. “Shareholder Votes on Sale.” *Working Paper, University of Bonn* .
- Stein, Jeremy C. 1988. “Takeover Threats and Managerial Myopia.” *Journal of Political Economy* 96 (1):61–80.
- Van Wesep, Edward D. 2014. “The Idealized Electoral College Voting Mechanism and Shareholder Power.” *Journal of Financial Economics* 113 (2):90–108.

- Villalonga, Belen and Raphael Amit. 2006. "How Do Family Ownership, Control and Management Affect Firm Value." *Journal of Financial Economics* 80 (2):385–417.
- Yermack, David. 2010. "Shareholder Voting and Corporate Governance." *Annual Review of Financial Economics* 2 (1):103–125.
- Zwiebel, Jeffrey. 1995. "Block Investment and Partial Benefits of Corporate Control." *The Review of Economic Studies* 62 (2):161–185.

Appendix - Proofs

Proof of Lemma 1. Given the realization of q , a shareholder indexed by b votes his shares for the proposal if and only if $q > -b$. Denote the fraction of post-trade shares voted to approve the proposal by $\Lambda(q)$. Note that $\Lambda(q)$ is weakly increasing (everyone who votes “for” given a smaller q will also vote “for” given a larger q , and there might be a non-negative mass of new shareholders who start voting “for”). If for the highest possible $q = \Delta$, we have $\Lambda(\Delta) \leq \tau$, then q^* in the statement of the lemma is equal to Δ (because the proposal is never approved). Similarly, if for the lowest possible $q = -\Delta$, we have $\Lambda(-\Delta) > \tau$, then q^* in the statement of the lemma is equal to $-\Delta$ (because the proposal is always approved). Finally, if $\Lambda(-\Delta) \leq \tau < \Lambda(\Delta)$, there exists $q^* \in [-\Delta, \Delta]$ such that the fraction of votes voted in favor of the proposal is greater than τ if and only if $q > q^*$. Hence, the proposal is approved if and only if $q > q^*$. ■

Proof of Proposition 2. We consider three cases. First, suppose $H(q^*) > \phi$. In this case, $v(b, q^*)$ increases in b , and a shareholder with bias b buys x shares if

$$v(b, q^*) > p \Leftrightarrow b > b_a \equiv \frac{p - v_0 - H(q^*) \mathbb{E}[\theta|q > q^*]}{H(q^*) - \phi},$$

and sells e shares if $v(b, q^*) < p$. Therefore, the total demand for shares is $D(p) = x \Pr[b > b_a]$ and the total supply of shares is $S(p) = e \Pr[b < b_a]$. The market clears if and only if $D(p) = S(p) \Leftrightarrow$

$$\Pr[b < b_a] = \frac{x}{x + e} = \delta \Leftrightarrow b_a = G^{-1}(\delta).$$

Since $\delta \in (0, 1)$, we have $b_a \in (-\bar{b}, \bar{b})$. The price that clears the market is the valuation of the marginal trader b_a , and therefore, $p = v(b_a, q^*)$, as required.

Second, suppose $H(q^*) < \phi$. In this case, $v(b, q^*)$ decreases in b , and a shareholder with bias b buys x shares if

$$v(b, q^*) > p \Leftrightarrow b < b_c \equiv \frac{p - v_0 - H(q^*) \mathbb{E}[\theta|q > q^*]}{H(q^*) - \phi},$$

and sells e shares if $v(b, q^*) < p$. Therefore, the total demand for shares is $D(p) = x \Pr[b < b_c]$ and the total supply of shares is $S(p) = e \Pr[b > b_c]$. The market clears if and only if $D(p) = S(p) \Leftrightarrow$

$$\Pr[b < b_c] = \frac{e}{x + e} = 1 - \delta \Leftrightarrow b_c = G^{-1}(1 - \delta).$$

Since $\delta \in (0, 1)$, we have $b_c \in (-\bar{b}, \bar{b})$. The price that clears the market is the valuation of the marginal trader b_c , and therefore, $p = v(b_c, q^*)$, as required.

Finally, suppose $H(q^*) = \phi$. In this case, the expected value of each shareholder is

$$v(b, q^*) = v_0 + H(q^*) \mathbb{E}[\theta|q > q^*] = v_0 + \phi \mathbb{E}[\theta|q > q^*].$$

The market can clear only if $p = v_0 + \phi \mathbb{E}[\theta | q > q^*]$, since otherwise, either all shareholders would want to buy shares or all shareholders would want to sell their shares. Notice that shareholder value does not depend on b , and that market clearing implies that all shareholders are indifferent between buying and selling shares. Based on the tie-breaking rule we adopt, shareholders will not trade. ■

Proof of Proposition 3. According to Lemma 1, any equilibrium is characterized by some cutoff q^* at the voting stage. We consider three cases.

First, suppose that $H(q^*) > \phi$ (activist equilibrium). The arguments in the proof of Proposition 2 can again be repeated word for word. In particular, the marginal trader is b_a as given by (8), and after the trading stage, the shareholder base consists entirely of shareholders with $b > b_a$. Consider a realization of q . If $q > -b_a$, the proposal is accepted ($b > b_a > -q$ for all shareholders of the firm). If $q < -b_a$, then shareholders who vote in favor are those with $b \in (-q, \bar{b}]$ out of $b \in (b_a, \bar{b}]$, which gives a fraction of $\Pr[-q < b | b_a < b]$ affirmative votes. Hence, the proposal is accepted if and only if either (1) $q > -b_a$ or (2) $q < -b_a$ and $\Pr[-q < b | b_a < b] > \tau$, where the condition in (1) is equivalent to $q > -G^{-1}(\delta)$, and the conditions in (2) are together equivalent to

$$\begin{aligned} \Pr[-q < b | b_a < b, q < -b_a] &> \tau \Leftrightarrow 1 - G(-q) > \tau(1 - G(b_a)) = \tau(1 - \delta) \\ &\Leftrightarrow q > -G^{-1}(1 - \tau(1 - \delta)). \end{aligned}$$

Hence, the proposal is accepted if and only if $q > q_a = \min\{-G^{-1}(\delta), -G^{-1}(1 - \tau(1 - \delta))\}$, and since $\delta < 1 - \tau(1 - \delta)$, the cutoff in this “activist” equilibrium is q_a as given by (10). Similarly to the proof of Proposition 2, the share price is $p_a = v(b_a, q_a)$.

Second, suppose that $H(q^*) < \phi$ (conservative equilibrium). The arguments in the proof of Proposition 2 can again be repeated here. In particular, the marginal trader is b_c as given by (9), and after the trading stage, the shareholder base consists entirely of shareholders with $b < b_c$. Consider a realization of q . Recall that shareholder b votes for the proposal if and only if $q > -b$. Hence, if $q < -b_c$, all shareholders of the firm vote against ($b < b_c < -q$), so the proposal is rejected. If $q > -b_c$, then shareholders who vote in favor are those with $b \in (-q, b_c)$ out of $b \in [-\bar{b}, b_c)$, which gives a fraction of $\Pr[-q < b < b_c | b < b_c]$ affirmative votes. Hence, the proposal is accepted if and only if $-q < b_c$ and $\tau < \Pr[-q < b < b_c | b < b_c]$, which are together equivalent to

$$\begin{aligned} \tau < \frac{\Pr[b < b_c] - \Pr[b < -q]}{\Pr[b < b_c]} &\Leftrightarrow \Pr[b < -q] < (1 - \tau) \Pr[b < b_c] \\ &\Leftrightarrow G(-q) < (1 - \tau)(1 - \delta) \Leftrightarrow q > -G^{-1}((1 - \tau)(1 - \delta)). \end{aligned}$$

Hence, the cutoff in this “conservative” equilibrium is q_c , given by (11). Similarly to the proof of Proposition 2, the share price is $p_c = v(b_c, q_c)$.

Third, suppose $H(q^*) = \phi$. In this case, the value of each shareholder is

$$v(b, q^*) = v_0 + H(q^*) \mathbb{E}[\theta | q > q^*] = v_0 + \phi \mathbb{E}[\theta | q > q^*].$$

Therefore, the market can clear only if $p = v_0 + \phi \mathbb{E}[\theta | q > q^*]$. Notice that shareholder value does not depend on b , and that market clearing implies that all shareholders are indifferent between buying and selling shares. Based on the tie-breaking rule we adopt, shareholders will not trade. Therefore, the post-trade shareholder base is identical to the pre-trade shareholder base. Next, note that $H(q^*) = \phi$ implies that the proposal is accepted if and only if $q > F^{-1}(1 - \phi)$. Since a shareholder votes for the proposal if and only if $q > -b$, it must be that the fraction of initial shareholders with $F^{-1}(1 - \phi) > -b$ is exactly τ , which is equivalent to $1 - G(-F^{-1}(1 - \phi)) = \tau$, or $G^{-1}(1 - \tau) = -F^{-1}(1 - \phi)$. This is a knife-edge case that we ignore, since it does not hold generically.

Finally, notice that $q_a < q_c$, and therefore, either $H(q_c) < \phi$, or $H(q_a) > \phi$, or both. Therefore, an equilibrium always exists (but may be non-unique if $H(q_c) < \phi < H(q_a)$). This completes the proof.

As a side note, notice also that many other tie-breaking rules, those in which all shareholders follow the same strategy upon indifference (e.g., buy $r \in [-e, x]$ shares), would also eliminate this type of equilibrium. Indeed, if all shareholders buy or sell a certain (the same across shareholders) amount of shares upon indifference, the market is unlikely to clear. For the market to clear, shareholders with different biases would need to behave differently when they are indifferent between buying and selling shares, that is, the tie-breaking rule has to differ across shareholders in a particular way. Since such a tie-breaking rule is somewhat arbitrary, we ruled it out as an unlikely outcome. ■

Proof of Proposition 4. Note that condition (12) can be written as

$$(1 - \delta)(1 - \tau) < G(-F^{-1}(1 - \phi)) < 1 - \tau(1 - \delta). \quad (21)$$

To see the point about δ , note that (21) is equivalent to

$$\delta > \max \left\{ 1 - \frac{G(-F^{-1}(1 - \phi))}{1 - \tau}, 1 - \frac{1 - G(-F^{-1}(1 - \phi))}{\tau} \right\}.$$

To see the point about τ , note that (21) is equivalent to

$$1 - \frac{G(-F^{-1}(1 - \phi))}{1 - \delta} < \tau < \frac{1 - G(-F^{-1}(1 - \phi))}{1 - \delta}.$$

To see the point about ϕ , note that (21) is equivalent to

$$1 - F(-G^{-1}((1 - \delta)(1 - \tau))) < \phi < 1 - F(-G^{-1}(1 - \tau(1 - \delta))).$$

Finally, notice that as $\bar{b} \rightarrow 0$, the bias of the post-trade shareholder base becomes homogeneous at zero, and in particular, the marginal voter must converge to zero as well. This implies $\lim_{\bar{b} \rightarrow 0} q^* = 0$ in any equilibrium, and thus, the voting equilibrium must be unique: it is an activist equilibrium if and only if $H(0) < \phi$. Therefore, condition (12) can be satisfied only if \bar{b} is sufficiently large, as required. ■

Proof of Lemma 2. Recall that in the activist equilibrium, market clearing implies $\Pr [b < b_a] e = \Pr [b > b_a] x$, where $\Pr [b > b_a] = 1 - \delta = \frac{e}{x+e}$. Therefore,

$$\begin{aligned} W_a &= \Pr [b < b_a] e p_a + \Pr [b > b_a] \mathbb{E} [(e + x) v (b, q_a) - x p_a | b > b_a] \\ &= \Pr [b > b_a] x p_a + \Pr [b > b_a] \mathbb{E} [(e + x) v (b, q_a) - x p_a | b > b_a] \\ &= \Pr [b > b_a] \mathbb{E} [(e + x) v (b, q_a) | b > b_a] = (1 - \delta) (e + x) \mathbb{E} [v (b, q_a) | b > b_a] \\ &= e \mathbb{E} [v (b, q_a) | b > b_a] = e v (\mathbb{E} [b | b > b_a], q_a) = e v (\beta_a, q_a), \end{aligned}$$

where the second to last equality follows from the linearity of $v (b, q_a)$ in b . The proof for the conservative equilibrium is similar and for brevity, is presented in Section B.3 of the Online Appendix. ■

Proof of Proposition 5. First, consider the activist equilibrium. Recall that in this equilibrium $W_a = e \cdot v (\beta_a, q_a)$ and $p_a = v (b_a, q_a)$. Then, a change in parameters that affects the marginal voter (q_a) without changing the marginal trader only affects W_a and p_a through its effect on q_a . Also recall that based on (17), $v (\beta_a, q^*)$ is a hump-shaped function in q^* with a maximum at $q^* = -\beta_a$, and $v (b_a, q^*)$ is a hump-shaped function in q^* with a maximum at $q^* = -b_a$. Since $-b_a < q_a - \beta_a$ by assumption of the proposition, any small enough change in parameters that leaves this order unchanged ($-b_a < q_a - \beta_a$) either increases the distance to $-\beta_a$ but decreases the distance to $-b_a$, or vice versa. Hence, this change of parameters necessarily moves prices and welfare in opposite directions. The proof for the conservative equilibrium is similar and for brevity, is presented in Section B.3 of the Online Appendix. ■

Proof of Lemma 4. We prove a more general result, that both price and shareholder welfare increase with δ . Indeed, based on Proposition 2, the share price is

$$p_{NoVote} (q^*) = v_0 + H (q^*) \mathbb{E} [q | q > q^*] + \begin{cases} b_c (H (q^*) - \phi) & \text{if } H (q^*) < \phi \\ b_a (H (q^*) - \phi) & \text{if } H (q^*) > \phi, \end{cases}$$

and the expected shareholder welfare is

$$W_{NoVote} (q^*) = e \cdot \left[v_0 + H (q^*) \mathbb{E} [q | q > q^*] + \begin{cases} \beta_c (H (q^*) - \phi) & \text{if } H (q^*) < \phi \\ \beta_a (H (q^*) - \phi) & \text{if } H (q^*) > \phi. \end{cases} \right]$$

Recall that $b_c = G^{-1} (1 - \delta)$, $\beta_c = \mathbb{E} [b | b < b_c]$, $b_a = G^{-1} (\delta)$, and $\beta_a = \mathbb{E} [b | b > b_a]$. Thus, $p_{NoVote} (q^*)$ and $W_{NoVote} (q^*)$ depend on δ only through their effect on b_c and b_a . Since, by Corollary 1, b_c and β_c are decreasing in δ , and b_a and β_a are increasing in δ , both $p_{NoVote} (q^*)$ and $W_{NoVote} (q^*)$ increase in δ . ■

Proof of Proposition 6. To prove the proposition, we prove a more general result, which characterizes the conditions under which shareholder welfare and the share price increase or decrease in δ :

DL:

General result for Proposition 6: *There exist $\underline{\delta}$ and $\bar{\delta}$, $0 < \underline{\delta} < \bar{\delta} < 1$, such that:*

- (i) *The share price increases in δ if $\delta > \bar{\delta}$, and decreases in δ if $\delta < \underline{\delta}$ and $|H(q_{NoTrade}) - \phi|$ is sufficiently small.*
(ii) *Shareholder welfare increases in δ if $\delta > \bar{\delta}$, and decreases in δ if $\delta < \underline{\delta}$, $|H(q_{NoTrade}) - \phi|$ is sufficiently small, and the marginal voter in the no-trade benchmark is more extreme than the average shareholder.*

Proof of the general result:

First, consider the activist equilibrium, which exists if and only if $H(q_a) - \phi > 0$. Recall that $p_a = v(b_a, q_a)$ and $W_a = e \cdot v(\beta_a, q_a)$, where $b_a = G^{-1}(\delta)$, $\beta_a = \mathbb{E}[b|b > b_a] = \frac{1}{G(1-b_a)} \int_{b_a}^{\bar{b}} b dG(b)$, and $q_a = -G^{-1}(1 - \tau(1 - \delta))$. Using (7),

$$\frac{\partial p_a}{\partial \delta} = \frac{\partial b_a}{\partial \delta} (H(q_a) - \phi) - (b_a + q_a) \frac{\partial q_a}{\partial \delta} f(q_a) \tag{22}$$

and

$$\frac{1}{e} \frac{\partial W_a}{\partial \delta} = \frac{\partial \beta_a}{\partial \delta} (H(q_a) - \phi) - (\beta_a + q_a) \frac{\partial q_a}{\partial \delta} f(q_a). \tag{23}$$

Using (10) and (8), we get $\frac{\partial q_a}{\partial \delta} = -\frac{\tau}{g(-q_a)} < 0$, $\frac{\partial b_a}{\partial \delta} = \frac{1}{g(b_a)} > 0$, and

$$\begin{aligned} \frac{\partial \beta_a}{\partial \delta} &= \frac{-\frac{\partial b_a}{\partial \delta} b_a g(b_a) [1 - G(b_a)] + \left[\int_{b_a}^{\bar{b}} b g(b) db \right] g(b_a) \frac{\partial b_a}{\partial \delta}}{[1 - G(b_a)]^2} \\ &= \frac{\partial b_a}{\partial \delta} \frac{g(b_a)}{1 - G(b_a)} (\beta_a - b_a) = \frac{\beta_a - b_a}{1 - G(b_a)} > 0. \end{aligned}$$

Plugging into (22) and (23), we get

$$\begin{aligned} \frac{\partial p_a}{\partial \delta} &= \frac{H(q_a) - \phi}{g(b_a)} + \tau (b_a + q_a) \frac{f(q_a)}{g(-q_a)}, \\ \frac{1}{e} \frac{\partial W_a}{\partial \delta} &= \frac{H(q_a) - \phi}{1 - G(b_a)} (\beta_a - b_a) + \tau (\beta_a + q_a) \frac{f(q_a)}{g(-q_a)}. \end{aligned}$$

Notice that as $\delta \rightarrow 1$, b_a , β_a , and $-q_a$ all converge to \bar{b} , and $H(q_a) - \phi \rightarrow H(-\bar{b}) - \phi$. Suppose the activist equilibrium exists in the limit (which is the case if $H(-\bar{b}) > \phi$). Since g is positive on $[-\bar{b}, \bar{b}]$, $\lim_{\delta \rightarrow 1} \frac{\partial p_a}{\partial \delta} = \frac{H(-\bar{b}) - \phi}{g(\bar{b})} > 0$.

In addition, $\lim_{\delta \rightarrow 1} \frac{1}{e} \frac{\partial W_a}{\partial \delta} = (H(-\bar{b}) - \phi) \lim_{\delta \rightarrow 1} \frac{\beta_a - b_a}{1 - G(b_a)}$. Using l'Hopital's rule,

$$\lim_{\delta \rightarrow 1} \frac{\beta_a - b_a}{1 - G(b_a)} = \lim_{\delta \rightarrow 1} \frac{\frac{\partial \beta_a}{\partial \delta} - \frac{\partial b_a}{\partial \delta}}{-g(b_a) \frac{\partial b_a}{\partial \delta}} = \frac{1}{g(\bar{b})} - \lim_{\delta \rightarrow 1} \frac{\beta_a - b_a}{1 - G(b_a)}$$

which implies $\lim_{\delta \rightarrow 1} \frac{\beta_a - b_a}{1 - G(b_a)} = \frac{1}{2} \frac{1}{g(\bar{b})} > 0$. Therefore, $\lim_{\delta \rightarrow 1} \frac{\partial W_a}{\partial \delta} > 0$.

Also notice that as $\delta \rightarrow 0$, we have $b_a \rightarrow -\bar{b}$, $\beta_a \rightarrow \mathbb{E}[b]$, and $q_a \rightarrow q_{NoTrade} = -G^{-1}(1 - \tau) < \bar{b}$. Suppose the activist equilibrium exists in this limit (which is the case if $H(q_{NoTrade}) > \phi$). Then

$$\lim_{\delta \rightarrow 0} \frac{\partial p_a}{\partial \delta} = \frac{H(q_{NoTrade}) - \phi}{g(-\bar{b})} + \tau(-\bar{b} + q_{NoTrade}) \frac{f(q_{NoTrade})}{g(-q_{NoTrade})},$$

where the second term is strictly negative because $-\bar{b} + q_{NoTrade} < 0$ and the density f is positive. Hence, $\lim_{\delta \rightarrow 0} \frac{\partial p_a}{\partial \delta} < 0$ if $|H(q_{NoTrade}) - \phi|$ is sufficiently small. Also notice that

$$\lim_{\delta \rightarrow 0} \frac{1}{e} \frac{\partial W_a}{\partial \delta} = (H(q_{NoTrade}) - \phi)(\mathbb{E}[b] + \bar{b}) + \tau(\mathbb{E}[b] + q_{NoTrade}) \frac{f(q_{NoTrade})}{g(-q_{NoTrade})}. \quad (24)$$

Thus, if $\mathbb{E}[b] + q_{NoTrade} < 0$ (i.e., the marginal voter in the no-trade benchmark is more extreme (activist) than the average shareholder) and $|H(q_{NoTrade}) - \phi|$ is small enough, then $\lim_{\delta \rightarrow 0} \frac{\partial W_a}{\partial \delta} < 0$.

The analysis for the conservative equilibrium is similar and for brevity, is presented in Section B.3 of the Online Appendix. It shows that (1) $\lim_{\delta \rightarrow 1} \frac{\partial W_c}{\partial \delta} > 0$ and (2) that if $\mathbb{E}[b] + q_{NoTrade} > 0$ (i.e., the marginal voter is more extreme (conservative) than the average post-trade shareholder) and $|H(q_{NoTrade}) - \phi|$ is small enough, then $\lim_{\delta \rightarrow 0} \frac{\partial W_c}{\partial \delta} < 0$.

Given the strictly positive (negative) limits of $\frac{\partial p}{\partial \delta}$ and $\frac{\partial W}{\partial \delta}$ as $\delta \rightarrow 1$ ($\delta \rightarrow 0$) for any equilibrium as long as it exists, it follows that under the conditions of the proposition, there exist $\underline{\delta}$ and $\bar{\delta}$, $0 < \underline{\delta} < \bar{\delta} < 1$, such that both the share price and welfare in any equilibrium that exists increase (decrease) in δ for $\delta > \bar{\delta}$ ($\delta < \underline{\delta}$), as required. ■

Proof of Proposition 7. We start by noting that if $q^* = H^{-1}(\phi)$, then all shareholders are indifferent between buying and selling, and the tie-breaking rule we adopt implies that in equilibrium, no shareholder trades. While this tie-breaking rule implies that the trading strategies of shareholders in the delegation equilibrium are not continuous in q^* as $q^* \rightarrow H^{-1}(\phi)$, the expected welfare of shareholders in any equilibrium continuously converges to welfare in the equilibrium with $q^* = H^{-1}(\phi)$. Indeed, shareholder welfare in the equilibrium in which $q^* = H^{-1}(\phi)$ and shareholders thus do not trade is

$$e \cdot \mathbb{E}[v(b, H^{-1}(\phi))] = e \cdot v(\mathbb{E}[b], H^{-1}(\phi)) = e \cdot (v_0 + \phi \mathbb{E}[\theta | q > H^{-1}(\phi)]). \quad (25)$$

Using (16) and (7), it is easy to see that the limit of shareholder welfare in both the conservative equilibrium ($e \cdot \lim_{q^* \searrow H^{-1}(\phi)} v(\beta_c, q^*)$) and in the activist equilibrium ($e \cdot \lim_{q^* \nearrow H^{-1}(\phi)} v(\beta_a, q^*)$) is the same and equals (25), as required.

Proof of (i). We first show that $b_m^* = \beta_a$ if $v(\beta_a, -\beta_a) > v(\beta_c, -\beta_c)$, and $b_m^* = \beta_c$ otherwise. The choice of the optimal board is equivalent to choosing the cutoff q^* that maximizes expected shareholder welfare. Recall from Section 5 and (17) that $v(b, q^*)$ is a hump-shaped function in q^* with a maximum at $q^* = -b$. Thus, within the range of q^* that generates a conservative equilibrium or the equilibrium where shareholders are indifferent and do not trade ($H(q^*) \leq \phi \Leftrightarrow q^* \geq H^{-1}(\phi)$), (16) implies that the optimal cutoff q^* is the point closest to $-\beta_c$ in this range, i.e., $\max\{-\beta_c, H^{-1}(\phi)\}$. Similarly, within the range of q^* that generates

an activist equilibrium or the equilibrium where shareholders are indifferent and do not trade ($H(q^*) \geq \phi \Leftrightarrow q^* \leq H^{-1}(\phi)$), the optimal cutoff q^* is the point closest to $-\beta_a$ in this range, i.e., $\min\{-\beta_a, H^{-1}(\phi)\}$. Since $\beta_c < \beta_a$, there are three cases to consider:

Case 1: If $H^{-1}(\phi) \leq -\beta_a$, then any $q^* < H^{-1}(\phi)$ generates an activist equilibrium, and it is welfare inferior to the equilibrium with $q^* = H^{-1}(\phi)$. At the same time, setting $q^* = -\beta_c$ would generate a conservative equilibrium that is superior to an equilibrium with $q^* = H^{-1}(\phi)$ because $-\beta_c > -\beta_a \geq H^{-1}(\phi)$. Therefore, in this case $b_m^* = \beta_c$.

Case 2: If $-\beta_c \leq H^{-1}(\phi)$, then any $q^* > H^{-1}(\phi)$ generates a conservative equilibrium, and it is welfare inferior to an equilibrium with $q^* = H^{-1}(\phi)$. At the same time, setting $q^* = -\beta_a$ would generate an activist equilibrium that is superior to an equilibrium with $q^* = H^{-1}(\phi)$ because $-\beta_a < -\beta_c \leq H^{-1}(\phi)$. Therefore, in this case $b_m^* = \beta_a$.

Case 3: If $-\beta_a < H^{-1}(\phi) < -\beta_c$, then the optimal cutoff among those that generate a conservative equilibrium is $-\beta_c$, and the optimal cutoff among those that generate an activist equilibrium is $-\beta_a$, and both generate higher welfare than $q^* = H^{-1}(\phi)$. Then, $b_m^* = \beta_a$ if $v(\beta_a, -\beta_a) > v(\beta_c, -\beta_c)$, and $b_m^* = \beta_c$ otherwise. Notice that

$$v(\beta_a, -\beta_a) > v(\beta_c, -\beta_c) \Leftrightarrow H^{-1}(\phi) > H^{-1}(\Phi) \Leftrightarrow \phi < \Phi, \quad (26)$$

where

$$\begin{aligned} \Phi &\equiv H(-\beta_c) + \mathbb{E}[\beta_a + q \mid -\beta_a < q < -\beta_c] \frac{H(-\beta_a) - H(-\beta_c)}{\beta_a - \beta_c} \\ &= H(-\beta_a) + \mathbb{E}[\beta_c + q \mid -\beta_a < q < -\beta_c] \frac{H(-\beta_a) - H(-\beta_c)}{\beta_a - \beta_c}. \end{aligned} \quad (27)$$

Thus, $b_m^* = \beta_a$ if $\phi < \Phi \Leftrightarrow H^{-1}(\phi) > H^{-1}(\Phi)$ and $b_m^* = \beta_c$ if $\phi > \Phi \Leftrightarrow H^{-1}(\phi) < H^{-1}(\Phi)$. Also notice that $H(-\beta_a) > \Phi > H(-\beta_c)$, which implies $-\beta_a < H^{-1}(\Phi) < -\beta_c$.

Taken together, the three cases above imply that $b_m^* = \beta_c$ if either $H^{-1}(\phi) \leq -\beta_a$ or $-\beta_a < H^{-1}(\phi)$ and $H^{-1}(\phi) < H^{-1}(\Phi)$. Since $-\beta_a < H^{-1}(\Phi)$, these two conditions together imply that $b_m^* = \beta_c$ if $H^{-1}(\phi) < H^{-1}(\Phi) \Leftrightarrow \phi > \Phi$. And, the three cases above imply that $b_m^* = \beta_a$ if either $-\beta_c \leq H^{-1}(\phi)$ or $H^{-1}(\phi) < -\beta_c$ and $H^{-1}(\Phi) < H^{-1}(\phi)$. Since $H^{-1}(\Phi) < -\beta_c$, these two conditions together imply that $b_m^* = \beta_a$ if $H^{-1}(\phi) > H^{-1}(\Phi) \Leftrightarrow \phi < \Phi$. If $\phi = \Phi$, both β_a and β_c give the highest possible shareholder welfare.

We conclude that $b_m^* = \beta_a$ if $\phi < \Phi \Leftrightarrow v(\beta_a, -\beta_a) > v(\beta_c, -\beta_c)$, and $b_m^* = \beta_c$ otherwise. The statement of part (ii) then automatically follows from the fact that $\beta_a = \mathbb{E}[b \mid b > b_a] > \mathbb{E}[b]$ and $\beta_c = \mathbb{E}[b \mid b < b_c] < \mathbb{E}[b]$.

Proof of (iii). Notice that the delegation equilibrium can replicate any conservative (activist) voting equilibrium if we set $b_m = -q_c$ ($b_m = -q_a$). Therefore, delegation to the optimal board always weakly dominates the voting equilibrium and strictly dominates it except the knife-edge cases when the voting equilibrium is already efficient, i.e., $q_c = -b_m^*$ or $q_a = -b_m^*$. Moreover, except for these knife-edge cases, given the continuity of the expected welfare function around b_m^* and a strictly possible benefit of delegation at b_m^* , it follows that there is a neighborhood around b_m^* such that if the manager's bias is in that neighborhood, then the delegation equilibrium is strictly more efficient than the voting equilibrium. ■

Proposition 8. *Suppose shareholders expect the activist (conservative) equilibrium in the voting game, and the optimal board induces an activist (conservative) equilibrium as well. Then, there exists $\bar{\tau} \in (0, 1)$ such that if $\tau \in (\bar{\tau}, 1)$, then at least $1 - \tau$ initial shareholders strictly prefer retaining their voting rights over delegation to the optimal board.*

Proof. We present the proof when shareholders expect the voting equilibrium to be activist. Section B.3 in the Online Appendix presents the proof when the voting equilibrium is expected to be conservative, which is very similar.

The expected payoff of shareholder b when the voting equilibrium is expected to be activist is

$$V_a(b, q^*) = \begin{cases} (e + x)v(b, q^*) - xv(b_a, q^*) & \text{if } b > b_a \\ ev(b_a, q^*) & \text{if } b \leq b_a. \end{cases} \quad (28)$$

Similarly, if shareholder b expects the delegation (to a board with bias $b_m = -q_m$) equilibrium to be activist, his expected payoff is $V_a(b, q_m)$. Recall that the delegation equilibrium is activist if and only if $H(q_m) > \phi \Leftrightarrow -q_m > -H^{-1}(\phi)$.

Consider as an alternative an activist board with bias $b_m = -q_m > -H^{-1}(\phi)$. Shareholder b prefers delegation to such a board over the activist voting equilibrium if and only if $V_a(b, q_a) < V_a(b, q_m)$. We consider several cases:

Case 1: If $b \leq b_a$, then

$$\begin{aligned} V_a(b, q_a) < V_a(b, q_m) &\Leftrightarrow v(b_a, q_a) < v(b_a, q_m) \Leftrightarrow \\ b_a(H(q_a) - H(q_m)) < H(q_m)\mathbb{E}[\theta|q > q_m] - H(q_a)\mathbb{E}[\theta|q > q_a]. \end{aligned}$$

(1a) If in addition $q_a > q_m$, then $H(q_a) - H(q_m) < 0$, so

$$V_a(b, q_a) < V_a(b, q_m) \Leftrightarrow b_a > \mathbb{E}[-q | -q_a < -q < -q_m],$$

which never holds given that $-q_a > b_a$. Thus, shareholders $b \leq b_a$ never support delegation to a board who is more extreme than the marginal voter, i.e., $q_m < q_a \Leftrightarrow b_m > -q_a$.

(1b) If instead $q_a < q_m$, then $H(q_a) - H(q_m) < 0$, so

$$V_a(b, q_a) < V_a(b, q_m) \Leftrightarrow b_a < \mathbb{E}[-q | -q_m < -q < -q_a].$$

Since $b_a < -q_a$, this always holds if $b_a \leq -q_m$ and might even hold if $b_a > -q_m$. Thus, shareholders with $b \leq b_a$ support delegation to a board whenever $-q_m \in [b_a, -q_a)$, and might even do so if $-q_m < b_a$.

Case 2: If $b > b_a$, then (2) and (28) imply

$$\begin{aligned} V_a(b, q_a) < V_a(b, q_m) &\Leftrightarrow v(b, q_a) - \delta v(b_a, q_a) < v(b, q_m) - \delta v(b_a, q_m) \Leftrightarrow \\ &v(b, q_a) - v(b, q_m) < \delta[v(b_a, q_a) - v(b_a, q_m)] \Leftrightarrow \\ &b(H(q_a) - H(q_m)) + H(q_a)\mathbb{E}[\theta|q > q_a] - H(q_m)\mathbb{E}[\theta|q > q_m] \\ &< \delta[b_a(H(q_a) - H(q_m)) + H(q_a)\mathbb{E}[\theta|q > q_a] - H(q_m)\mathbb{E}[\theta|q > q_m]]. \end{aligned}$$

(2a) If in addition $q_a > q_m$, then $H(q_a) < H(q_m)$, so

$$V_a(b, q_a) < V_a(b, q_m) \Leftrightarrow b > \delta b_a + (1 - \delta) \mathbb{E}[-q | -q_a < -q < -q_m],$$

and notice that since $-q_a > b_a$, then $\delta b_a + (1 - \delta) \mathbb{E}[-q | -q_a < -q < -q_m] > b_a$.

(2b) If instead $q_a < q_m$, then $H(q_a) > H(q_m)$, so

$$V_a(b, q_a) < V_a(b, q_m) \Leftrightarrow b < \delta b_a + (1 - \delta) \mathbb{E}[-q | -q_m < -q < -q_a].$$

The overall support for delegation to the board is the combined support of shareholders with $b \leq b_a$ and $b > b_a$. Then:

(i) First, consider a board with $-q_m > -q_a \Leftrightarrow q_m < q_a$. Then only shareholders with $b > \delta b_a + (1 - \delta) \mathbb{E}[-q | -q_a < -q < -q_m] > b_a$ support delegation to the board. It follows that if $1 - G(b_a) < \tau \Leftrightarrow 1 - \delta < \tau$, then this type of board does not obtain τ -support.

(ii) Second, consider a board with $-q_m < -q_a \Leftrightarrow q_m > q_a$. Such a board obtains support from $b \leq b_a$ if $b_a < \mathbb{E}[-q | -q_m < -q < -q_a]$ and from $b > b_a$ that satisfy $b < \delta b_a + (1 - \delta) \mathbb{E}[-q | -q_m < -q < -q_a]$. There are two cases:

1. If $b_a > \mathbb{E}[-q | -q_m < -q < -q_a]$, then $\delta b_a + (1 - \delta) \mathbb{E}[-q | -q_m < -q < -q_a] < b_a$. Thus, in this case, there is no support for delegation from either shareholders with $b \leq b_a$ or from those with $b > b_a$.

2. If $b_a < \mathbb{E}[-q | -q_m < -q < -q_a]$, then $\delta b_a + (1 - \delta) \mathbb{E}[-q | -q_m < -q < -q_a] > b_a$. Thus, both shareholders with $b \leq b_a$ and with $b \in (b_a, \delta b_a + (1 - \delta) \mathbb{E}[-q | -q_m < -q < -q_a])$ support delegation. So overall, delegation receives support from shareholders with $b < \delta b_a + (1 - \delta) \mathbb{E}[-q | -q_m < -q < -q_a]$. Notice that $\mathbb{E}[-q | -q_m < -q < -q_a] < -q_a$, and hence the fraction of initial shareholders supporting delegation is

$$G(\delta b_a + (1 - \delta) \mathbb{E}[-q | -q_m < -q < -q_a]) < G(\delta b_a - (1 - \delta) q_a).$$

Note that $\lim_{\tau \rightarrow 1} q_a = -b_a$. Thus, $\lim_{\tau \rightarrow 1} G(\delta b_a - (1 - \delta) q_a) = G(b_a) < 1$.

Combining (i) and (ii), we conclude that as $\tau \rightarrow 1$, no activist board gains τ -support from shareholders if they expect the activist voting equilibrium. ■

about ECGI

The European Corporate Governance Institute has been established to improve *corporate governance through fostering independent scientific research and related activities*.

The ECGI will produce and disseminate high quality research while remaining close to the concerns and interests of corporate, financial and public policy makers. It will draw on the expertise of scholars from numerous countries and bring together a critical mass of expertise and interest to bear on this important subject.

The views expressed in this working paper are those of the authors, not those of the ECGI or its members.

ECGI Working Paper Series in Finance

Editorial Board

Editor	Mike Burkart, Professor of Finance, London School of Economics and Political Science
Consulting Editors	Franklin Allen, Nippon Life Professor of Finance, Professor of Economics, The Wharton School of the University of Pennsylvania Julian Franks, Professor of Finance, London Business School Marco Pagano, Professor of Economics, Facoltà di Economia Università di Napoli Federico II Xavier Vives, Professor of Economics and Financial Management, IESE Business School, University of Navarra Luigi Zingales, Robert C. McCormack Professor of Entrepreneurship and Finance, University of Chicago, Booth School of Business
Editorial Assistant	Úna Daly, Working Paper Series Manager

Electronic Access to the Working Paper Series

The full set of ECGI working papers can be accessed through the Institute's Web-site (www.ecgi.global/content/working-papers) or SSRN:

Finance Paper Series	http://www.ssrn.com/link/ECGI-Fin.html
-----------------------------	---

Law Paper Series	http://www.ssrn.com/link/ECGI-Law.html
-------------------------	---