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Leader-Follower Dynamics in Shareholder Activism

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ABSTRACT

We propose a theory of coordination and influence among blockholders. Privately informed activists time their trades in sequence to lower acquisition costs, prompting a strategic use of order flows: leader activists create trading gains for their followers, ultimately influencing their willingness to bear greater value-enhancing intervention costs. Through this channel, informed trades can exhibit predictability, in sharp contrast with Kyle (1985, *Econometrica* 53, 1315–1335). We explain how this novel predictability shapes free-rider problems affecting governance, and how it produces price abnormalities analogous to those documented empirically. We also uncover how private information interdependence can be a key catalyst for the mechanism studied.

THE THEORIES OF BLOCKHOLDERS HAVE proven key to understanding free-rider effects when ownership is dispersed (Shleifer and Vishny (1986)), the impact of market liquidity on governance by voice (Maug (1998)), and the role of

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disposing of shares in disciplining management (Admati and Pfleiderer (2009), Edmans (2009)). However, the fundamental question of how activist blockholders gear up to intervene in firms, anticipating that other investors think alike and can be influenced, is much less understood. This paper proposes a theory of influence dynamics between blockholders at the center of which are market signals.

The empirical relevance of multiactivist interventions is reflected in the increased prevalence of events featuring multiple *hedge funds* engaging with the same target (e.g., Becht et al. (2017)). In the United States, this form of coordination has coincided with three trends in the activism ecosystem: an increase in institutional investors' ownership share of corporations, a regulatory environment that permits substantial communication among shareholders while imposing significant restrictions on formally organized groups, and an increased focus both on higher-market-capitalization firms as targets and on more specialized forms of interventions.[1] As activism costs grow—to acquire sizable blocks and to perform actual restructurings—blockholder coordination becomes a key cost-management tool.[2] While the prevailing regulation facilitates a common understanding of potential targets and of the incentives at play, it discourages the use of explicit agreements.

In this paper, we show that such coordination can be achieved noncooperatively. Our premise is that, to control costs, activists have strong incentives to time their trades in sequence. But this means that any "leader activist" will inevitably use market signals to credibly communicate with "follower activists" to acquire a larger share and exert more effort to improve firms. Specifically, two activists decide how much stake to (de)accumulate in a market structure à la Kyle (1985)—for simplicity, private information corresponds to initial blocks and firm value is determined by effort choices, as in Back et al. (2018). To this baseline setting, we first add *block interdependence*—the activists' initial positions exhibit correlation (e.g., if positive because of similar investment styles). We further add sequential trading—in the first period, a *leader* (she) activist acts as the unique informed trader, anticipating that a *follower* (he) will play that role in the second period. After the activists finalize their blocks through these trades, both simultaneously exert effort in line with their terminal positions to determine the firm's share (fundamental) value.

This setup and the variations that we study constitute the first framework for examining block accumulation dynamics when multiple activists intervene

[1] Brav, Jiang, and Li (2022) argue that low-hanging fruit—targets suffering from issues that can be fixed with standard governance tactics—has been exhausted postfinancial crisis. As a result, activism as an investment strategy has matured along three dimensions: increased reliance on industry consultants that help guide interventions; production and dissemination of detailed analyses about targeted firms; and development of expertise specific to particular industries. See section 3.2.3 in their paper for examples.

[2] Salesforce was a target in 2022 when its valuation was around \$130B. Crucially, none of the five activists involved reached 5% ownership, or \$6.5B—see Garfinkle (2023). Regarding activism expenses other than block-building costs, Gantchev (2013) finds that activists' entire campaigns can add up to a total of \$10M, while Albuquerque, Fos, and Schroth (2022) estimate intervention costs at \$2.43M.

in firms and impose externalities on each other. We use our model to offer new insights on trading around activism events, to derive new predictions about the quality of corporate governance as orchestrated by leader activists, and to provide new interpretations of existing empirical findings.

Trading. In traditional microstructure models such as Kyle (1985), it is price impact that limits an investor's incentive to exploit an informational advantage when trading in a firm's stock. With endogenous fundamentals and multiple traders, a second channel also operates: creating trading gains that induce fellow activists to accumulate more shares, and thus to find it optimal to bear more of the value-generating activism costs.

The follower's trading gains are measured by how far the market price—a belief about the activists' effort choices based on the public order flow—departs from the follower's own belief about the firm's value. This belief depends on not only his initial block but also the order flow, which conveys information about the leader's contribution. This difference in beliefs—a form of mispricing—now enters the leader's calculations: she not only balances her trading gains with the cost of driving the price against herself, but she also evaluates how her trades affect the inference of the follower vis-à-vis that of the market maker.

Correlation plays a key role in resolving this trade-off. If positive, an abnormally high first-period order flow indicates to the market maker not only a large contribution by the leader, but also by the follower; instead, due to his private information, the follower updates only about the leader's effort. Thus, the price is *more responsive* to the first-period order flow than is the follower's belief about the firm, while the opposite holds with negative correlation: the price increases less because the market maker's updates on each activist's effort move in opposite directions. With prices that are relatively more responsive, buying more aggressively is more costly than when price impact is the only disciplinary force, as such trades now also discourage the follower from building a larger stake—and vice versa.

Theorem 1 formalizes this logic by uncovering a linear equilibrium in which activists with larger initial blocks accumulate more shares in relative terms than their smaller-block counterparts, as in Kyle-type models in which insiders with more optimistic signals about a firm's fundamentals naturally acquire more stock. The novelty of our equilibrium, however, is that the leader's trades are no longer neutral: the leader sells on average when correlation is positive and buys otherwise. That is, being able to influence other blockholders using market signals does not merely translate into more or less aggressive trading while preserving the pervasive property in Kyle (1985) that trades are unpredictable: if activism is at play, the nature of strategic trading changes fundamentally. When it comes to trading blockholders then, this finding alters the conventional wisdom of strategic trading models reinforced over decades following Kyle's seminal work.

Private Information. Our choice of private initial positions is empirically relevant for three reasons: hedge funds' stakes are typically small, so-called "under the threshold" campaigns have been on the rise, and large-cap firms are becoming more frequent targets.[3] That said, what matters for our result is that private information has interdependence, that is, the activists know more about each other, and not particularly where it comes from. Indeed, if initial blocks are public, qualitatively identical results arise if private information is about exogenous components of a firm's value or about the activists' productivity in improving firms.

In turn, a nontrivial degree of interdependence is important due solely to the minimal assumptions imposed on the timing of trades and players' payoffs. In fact, if both activists trade simultaneously over two rounds, or if they impose other types of externalities on each other (e.g., losing private benefits) the same phenomenon that we uncover can arise even when initial positions are uncorrelated. Section II.B examines these and other robustness checks.

Governance and Price Abnormalities. From an institutional perspective, the way to interpret our finding on average trades is that a leader's accumulation of shares may depart meaningfully from its counterpart when intervening in isolation. In particular, when correlation is positive, a leader with a sufficiently large block will still buy shares, but not as aggressively. Importantly, by building a smaller block than she otherwise would, the leader effectively offloads activism costs onto the follower, imposing a form of externality that the follower finds optimal to bear; if correlation is negative, the leader incentivizes the follower by herself accumulating more shares and bearing greater activism expenses.

Because terminal positions determine effort provision, trading has nontrivial implications for both the quality of corporate governance and stock prices. On the first front, note that since the follower does not change his position on average (due to not having the opportunity to influence any subsequent activist), all nontrivial implications for firm value are linked to the leader's behavior: when correlation is positive (negative), the leader lowers (increases) firm value relative to the counterfactual world in which blocks do not change on average. That is, with positive interdependence, a first-mover advantage in trading amplifies traditional free-rider effects, but not otherwise. Irrespective of the inefficiencies created, however, multiplayer interactions always deliver more value than their single-player counterparts (Theorem 2).

On the second front, the model naturally delivers measures of abnormality analogous to those documented empirically. The idea is to note that if activism opportunities are absent (i.e., fundamentals appear as exogenous), and hence trading is based solely on exploiting informational advantages, trades are expected to be unpredictable—in such "normal times," positions should not change on average. We can then cast our predictions regarding firm value in "price" form: if correlation is positive, prices are predicted to be *abnormally* low on average (and vice versa) relative to counterfactual periods in which activism is not at play. In Section III.B, we explain how this logic can be used

[3] We expand on the importance of smaller blocks in Section I.B. Campaigns with blocks below 5% were majority in the United States in 2021 and the targets had higher market capitalization. See Squire (2022).

to reinterpret existing empirical findings on price behavior around disclosure events. We also discuss recent evidence that is closest to our proposed mechanism and predictions, and provide directions for how the empirical literature on blockholders and trading can incorporate our results going forward.

First-Mover Advantages. Section IV examines factors that favor the sequential trading structure studied. As we show, there is a sizable region of correlation levels (positive and negative) over which both activists are individually better off than if trading simultaneously—coordinating the timing of trades is *mutually beneficial* because acquisition costs are lower in less competitive settings.[4] With significant negative correlation, however, an activist may prefer to trade simultaneously with a fellow activist because the latter always provides inexpensive liquidity when needed. On the other hand, increasing positive correlation enhances the leader's ability to influence the follower's trading gains, so moving first is even more desirable—at the expense of follower profits relative to the simultaneous-move case.

The bottom line is that a leader is more likely to emerge when there is *similarity* among activists, in a block-statistical sense. Furthermore, if the interdependence is positive, the benefit of acting as a leader is enhanced by three factors. First, by having a larger initial block, because this indicates that the follower has a large block too and hence that he will place sizable trades that exacerbate acquisition costs. Second, by the presence of multiple small followers, because these will aggressively compete to exploit trading gains. Third, by being capable of intervening in firms—if the leader is a passive fund that cannot exert effort, she can be trapped into an inferior outcome when trying to influence the follower.

Discussion. We conclude the paper with a discussion of two topics. The first, which is institutionally motivated, is the so-called "wolf-pack activism" phenomenon whereby multiple hedge funds attack the same firm in a parallel, seemingly independent, manner after a leader fund acquires a stake. Our model fits many of its features: trading gains matter, in that targets are undervalued firms; blocks are similar, of small to moderate size; behavior is noncooperative, due to the high costs of acting as a formal group; there are followers who do not disclose positions, and hence necessarily have smaller stakes; and competition is strong at the moment of trading. But our model can also be used to shed light on the real consequences of this inherently secretive phenomenon, where moves are naturally sequential and hence making correct inferences can be key—the Securities and Exchange Commission's 2023 guidance on "tipping" and group formation will likely make market signals an even more powerful coordinating device.

The second topic is the possibility of other equilibria in which the activists trade *against* their initial positions to coordinate with each other in terms of creating or destroying value. Despite this being an interesting theoretical

[4] This is of great importance for activists, in part because acquisition and activism costs reinforce each other. Only after acquiring a meaningful block does an incentive to spend resources to change a firm emerge.

possibility, we argue that these equilibria are less suitable for predicting "positive" activism in practice. We further provide conditions under which the equilibrium that we study is the unique prediction within the linear class.

Related Literature. Our research is influenced by the "program" proposed by Edmans and Holderness (2017), who highlight that only models with one activist building stakes in isolation, or with multiple activists and fixed blocks, have been studied. Going forward, they suggest considering blocks under 5%, allowing blockholders to interact and impose externalities on each other, allowing blockholders to act as informed traders, and considering activists' costs and benefits beyond those related to controlling firms.

We are not aware of other papers that combine these elements in dynamic settings. For instance, in Back et al. (2018)—a fully dynamic *single-activist version* of Kyle (1985)—different activism technologies can have nontrivial implications for market liquidity, but equilibrium trading is always unpredictable. Moreover, while there are models that involve multiple activists, these feature simultaneous moves among them: in Doidge, Dyck, and Yang (2025), activists trade noncooperatively only once and then act as a coalition when exerting effort; in Edmans and Manso (2011), competition strengthens the threat of disciplinary trading; and in Brav, Dasgupta, and Mathews (2022), reputational motives can lead hedge funds to exert effort to attract funding. Crucially, none of these papers considers the incentives to induce others to develop skin in the game as a means of controlling private costs or increasing private benefits.

Our model is one of activism by "voice"—direct interventions—because effort determines firm value. In contrast to models of "exit," where disposing of shares acts as an ex post disciplinary threat, in our model disposing of shares induces other activists to exert voice. This notion of share disposal favoring voice relates to models in which selling by liquidity (or "noise") traders facilitates block formation and activism (e.g., Kahn and Winton (1998), Maug (1998)). Gantchev and Jotikasthira (2018) corroborate this finding for activist hedge funds when institutional investors sell due to negative funding shocks. Instead, in our model, it is an activist who strategically creates favorable market conditions for others.

Activists not only influence firms, but also play a key role in the market for corporate control. In Burkart and Lee (2022), activists who first launch costly campaigns and then broker takeovers can mitigate free-rider problems by both target shareholders and activists themselves. Similarly, in Corum and Levit (2019), activists can launch costly proxy contests to lower acquisition costs and trigger ownership transfers that otherwise would not have happened—in our model, the leader bears direct activism costs (say, launching a campaign) and sacrifices trading gains to induce the follower to improve governance. See also Burkart, Gromb, and Panunzi (2000), where an incumbent wants to sell the majority of her shares to limit a bidder's incentive to extract value-dissipating private benefits after acquiring control.

We also connect with models of strategic trading featuring strategies of a more "manipulative nature": steering someone's real actions by influencing their beliefs. In models of trading, Goldstein and Guembel (2008) show that short-selling is a profitable strategy for a speculator if it induces a manager to forgo an investment decision, but buy orders are never fruitful there. In Attari, Banerjee, and Noe (2006), a passive fund may dump shares to insure the value of the remaining block, as activism by a second investor has positive returns only when a firm's fundamentals are low. In Khanna and Mathews (2012), a blockholder instead buys shares to counter a speculator's attempt to lower a firm's value. In contrast to these papers, all of our players directly influence firm values, and both buying and selling can be optimal.[5]

Finally, in the same line, but beyond financial markets, Holmström (1999), Cisternas (2018), Bonatti and Cisternas (2020), Cetemen (2020), Cetemen, Hwang, and Kaya (2020), Ekmekci et al. (2022), and Cisternas and Kolb (2025) develop models of belief manipulation that employ Gaussian fundamentals. A key novelty of our model is that noisier signals (here, order flows) can lead to more manipulation, despite beliefs (here, prices) becoming less responsive. This is because the leader's marginal incentive to manipulate beliefs—captured by her terminal block—is endogenous.

The remainder of the paper is organized as follows. Section I presents our model. Section II contains our main result. Section III summarizes the model's predictions and connects them with existing empirical work. Section IV discusses first-mover advantages and the institutional environment, including wolf packs. Section V discusses other equilibria and a refinement result. All proofs are in the Appendix or Internet Appendix.[6]

I. Model

In Section I.A, we introduce our baseline model and the type of equilibrium studied. In Section I.B, we discuss our assumptions in light of the institutional evidence on activism and anticipate how our results are unchanged when some of the assumptions are relaxed.

A. Setup

A *leader* activist (she) and a *follower* counterpart (he) hold initial positions $X_0^L \in \mathbb{R}$ and $X_0^F \in \mathbb{R}$ of shares in a firm, respectively. Each activist's *block* is their private information. The prior is that blocks are normally distributed with mean $\mu > 0$, variance $\phi > 0$, and covariance ρ. By definition, the latter variable can take values in $[-\phi, \phi]$ only.

The model has three periods. In period 1, the leader acts as a single informed trader in a Kyle (1985) market structure. Specifically, she submits an order for $\theta^L \in \mathbb{R}$ units of the firm's stock to a competitive market maker who executes it

[5] See Yang and Zhu (2021), Boleslavsky, Kelly, and Taylor (2017), and Ahnert, Machado, and Pereira (2020), for models where trading can trigger government interventions, while Chakraborty and Yılmaz (2004), Brunnermeier (2005), and Williams and Skrzypacz (2025) for manipulation in financial markets abstracting from real consequences.

[6] The Internet Appendix may be found in the online version of this article.

at public price P_1 after observing total order flow of the form

$$\Psi_1 = \theta^L + \sigma Z_1.$$

In this specification, Z_1 is a standard normal random variable independent of the initial positions that captures noise traders, and volatility $\sigma > 0$ is a commonly known scalar.

Having observed P_1, in period 2 the follower replaces the leader as the single informed trader in an identical round of trading: he orders $\theta^F \in \mathbb{R}$ units from the same market maker who in turn executes the order at (public) price P_2 after observing total order flow

$$\Psi_2 = \theta^F + \sigma Z_2,$$

where Z_2 is standard normal and independent of (X_0^L, X_0^F, Z_1). Finally, in period 3 the activists simultaneously take actions that determine the firm's fundamentals: activist i exerts effort $W^i \in \mathbb{R}$ at private cost $\frac{1}{2}(W^i)^2$, $i \in \{L, F\}$, resulting in a *true share value* of

$$W = W^L + W^F.$$

That is, absent any activism, the share value is common knowledge and normalized to zero.

Toward stating our players' payoffs, let subscript T capture *terminal* positions, which for each activist consists of initial positions plus the amount traded:

$$X_T^i = X_0^i + \theta^i, \ \ i \in \{L, F\}. \tag{1}$$

We also let $(\mathcal{F}_t)_{t=0,1,2}$ denote public information, which is generated by the prior and order flows $(\Psi_t)_{t=1,2}$, and we use the indices $t(L) := 1$ and $t(F) := 2$ to link our activists with their corresponding trading periods. Activist $i \in \{L, F\}$ then solves

$$\sup_{\theta^i, W^i} \mathbb{E}\left[(W^i + W^{-i})X_T^i - P_{t(i)}\theta^i - \frac{1}{2}(W^i)^2 \middle| X_0^i, \mathcal{F}_{t(i)-1} \right], \tag{2}$$

where the first term is the total value of activist i's holdings, from which trading costs (second term) and activism expenses (third term) are subtracted. Furthermore, because the optimal choice of effort satisfies $W^i = X_T^i, \ i \in \{L, F\}$, the objective (2) can be written as

$$\sup_{\theta^i} \mathbb{E}\left[(X_T^i + X_T^{-i})X_T^i - P_{t(i)}\theta^i - \frac{1}{2}(X_T^i)^2 \middle| X_0^i, \mathcal{F}_{t(i)-1} \right], \ \ i \in \{L, F\}. \tag{3}$$

Two observations are in order. First, because individual effort is based on an activist's own terminal position, larger blocks translate into a stronger willingness to intervene. At the same time, there is a collective-action problem because the positive effect of individual effort on the other blockholder's holdings is not internalized. Second, the model allows for short positions ($X_0^i < 0$) and negative effort, the latter capturing value destruction or *negative activism*—see Sections II.B and V.[7] Unless otherwise stated, however, we focus on the opposite situation by assuming $\mu > 0$ and using the cases $X_0^L > 0$ and $X_0^F > 0$ to provide intuition: the activists are initially "long" on the firm and, absent any trading, they would exert positive effort, both conditionally and unconditionally.

Linear Strategies and Equilibrium Concept. As is traditional in the literature following Kyle (1985), we look for equilibria in *linear* strategies. This has two implications. First, our leader conditions on her type X_0^L and the prior mean μ (used by the market maker to set the firm's price) in a linear manner, while our follower can also condition on the observed first-period price. That is, we seek strategies of the form

$$\theta^L = \alpha_L X_0^L + \delta_L \mu \quad \text{and} \quad \theta^F = \alpha_F X_0^F + \beta_F P_1 + \delta_F \mu, \tag{4}$$

where the coefficients $(\alpha_L, \delta_L, \alpha_F, \beta_F, \delta_F)$ are scalars. Second, the price $P_{t(i)}$ set by the market maker is affine in the order flow $\Psi_{t(i)}$, $i = L, F$. In an equilibrium of this kind, the trading strategies are mutual best responses given the pricing rule, and the linear prices satisfy $P_{t(i)} = \mathbb{E}[W^L + W^F | \mathcal{F}_{t(i)}]$ when the expectation is computed using the activists' strategies (4). In what follows, we omit the linear qualifier when referring to an equilibrium.

We focus on equilibria exhibiting $\alpha_L > 0$ and $\alpha_F > 0$, or *positive block sensitivity* (PBS), for both conceptual and institutional reasons. On the first front, this type of equilibrium conforms with the literature following Kyle (1985), where an insider trades in proportion to her informational advantage: the difference between her private information and the public information before trading, which is a measure of mispricing or trading gains. Consequently, such trades are zero conditional on the public information, which for our leader would amount to $\alpha_L = -\delta_L$. This form of *unpredictability* is a pervasive finding in this literature, which treats fundamentals as exogenous.[8] But it also holds with endogeneity if there are multiple rounds of trading in single-player setups (e.g., Back et al., 2018), or if there are multiple players in static settings (e.g., Doidge, Dyck, and Yang (2025)). Our model, which combines endogenous fundamentals, multiple players, and dynamics, proves fundamentally different—the notion of PBS equilibrium is the appropriate one for making this distinction.

Economically, in this equilibrium, larger blockholders acquire more stock, or deaccumulate less, than their smaller counterparts: trading solidifies their

[7] See Bliss, Molk, and Partnoy (2019) for examples of negative activism, and Appel and Fos (2024) for short campaigns run by hedge funds. Refer to Belvedere (2019) for a famous case in which investors took opposite positions.

[8] See Back et al. (2018) for a discussion on this topic, where the term "inconspicuous insider trading" is used. This property holds for Gaussian exogenous fundamentals: for any number of traders and degree of correlation in private information (e.g., Foster and Viswanathan (1996) and Back, Cao, and Willard (2000)), for fundamentals that evolve over time (e.g., Caldentey and Stacchetti (2010)), or for stochastic volatility (e.g., Collin-Dufresne and Fos (2016)). It can also arise if the fundamentals are time-invariant and non-Gaussian (e.g., Back (1992)).

a priori stronger willingness to intervene, leading to more value-added in relative terms. While equilibria placing a negative weight on the initial block can also exist (Section V), they exhibit two key features: (i) strong position reversals can happen and (ii) these reversals can be driven by monetizing value destruction. From an institutional viewpoint, such equilibria are less suited for capturing positive activism—the more prevalent phenomenon and our main focus.

B. Discussion

That our game ends after the third period can be seen as the firm's true value becoming public after effort is undertaken. Since it takes time to change a firm, one may then wonder whether not allowing for multiple "prerevelation" rounds of trading is a limitation. Our belief is that this is not the case, for two reasons. First, since activists must reveal their *intended plans* when disclosing positions over 5%, substantial information about action plans gets revealed well ahead of changes materializing. Second, these disclosures also contain information about trades, revealing that hedge funds trade primarily on the day they cross the 5% threshold—the "trigger date"—or the day after (e.g., Bebchuk et al. (2013) and Collin-Dufresne and Fos (2015)). Thus, trades leading to block completion are not spread out.

Importantly, these trades often happen before the market learns activists' intentions and trades. This is because material adjustments to positions or intentions can be disclosed with a delay—historically, up to 10 days—so in effect trades remain hidden for some time as in our setup.[9] Our model is then best interpreted as taking place in such a predisclosure window when the activists have superior information and are gearing up to quickly finalize their positions and attack. Key questions are how block completion by a leader hedge fund responds to the possibility of subsequent followers building their own stakes and what are the implications for stock prices. We discuss the latter topic in Section III below.

Having offered a broad interpretation of our model, we now turn to our key assumptions.

Private Information and Interdependence. Because blocks below 5% need not be disclosed, they can constitute private information.[10] Hedge fund ownership fluctuates around this threshold: Brav, Jiang, and Li (2022) find that their median stake is 6.6% upon disclosure, while Collin-Dufresne and Fos (2015) state that, to complete their blocks (e.g., to reach 6.6%), hedge funds purchase around 1% of shares on the day that the 5% threshold is crossed—of course,

[9] The traditional disclosure requirement for activists to file a 13D form within 10 days after crossing the 5% threshold has been shortened to five business days, while material amendments must be filed within two business days. See U.S. Securities and Exchange Commission (2023b).

[10] An exception is when a fund holds more than 100 million in shares of publicly traded firms, in which case form 13F must be filed, even if there is no intention to intervene. As this form is filed quarterly, blocks in this category can be hidden over even longer horizons (e.g., Puckett and Yan (2011)).

these numbers do not include all of the (smaller) blocks that are not disclosed. Importantly, blockholders in the 1% to 5% range can have substantial power: Lewellen and Lewellen (2025) document that this segment collectively owns around 21% of shares in the average firm just like the group of blockholders with ownership above 5% own as a whole. Furthermore, in line with our assumptions, these authors also show that smaller blockholders are more likely to trade.

Conceptually speaking, assuming private information about initial blocks is simply one among several possibilities through which our mechanism of influence can emerge. Indeed, what really matters is that the activists have (i) some form of payoff-relevant private information that itself (ii) has *interdependence*. Regarding the first requirement, note that as long as trades are hidden, an activist's terminal position will also be their private information. But terminal positions determine the firm's value. This means that the activists effectively have long-term private information regarding the firm's value and can profitably trade on it, even if their initial blocks are public.[11] Section II.B formalizes this idea by examining two extensions that deliver the same predictions as our baseline model: the activists are privately informed about an exogenous component of the firm's value or about their cost of effort.

In turn, the second requirement of correlation is key to enable the leader to influence the follower using the order flow despite the market maker also responding to it. While we discuss this topic extensively in the next section, two observations are in order here. First, correlation is necessary only because of our minimal assumptions on the structure of trading and players' payoffs. To make this point, Section II.B presents two variations in which initial blocks are uncorrelated yet the mechanism uncovered is at play: an example in which there are two rounds of trading with both activists placing orders in each round, and an example in which the leader's effort imposes a negative externality on the follower (such as the loss of private benefits).

Second, assuming block correlation can be a useful avenue for testing the predictions of our model. Indeed, because both the sign and magnitude of the correlation have nontrivial effects on prices, existing empirical work on blockholder interdependence could be redirected toward contrasting the model's prediction regarding prices with the empirical evidence on price abnormality documented in several studies. We elaborate on this in Section III.B.

Payoffs. Assuming that efforts are perfect substitutes in the fundamentals' technology is a natural benchmark for examining how the well-known free-rider problems that arise when ownership is dispersed are affected by an activist's first-mover advantage. Furthermore, as Burkart and Lee (2022) note, our choice of a continuous effort variable can be seen as capturing different types of interventions that in turn require different levels of activist

[11] In the words of Collin-Dufresne and Fos (2015), the activists have private information about their *willingness to intervene*. In our setting, this is an intensive margin.

engagement.[12] Moreover, while many outcomes can be binary, our model can be seen as a linearized version of such settings in which the probability of success increases in total effort.

It is also worth noting that our choice of quadratic activism costs is in line with the tradition of trading costs in Kyle-type models. However, as Back et al. (2018) recently show, moving away from this case can yield new insights through the implied convexity/concavity of effort as a function of an activist's terminal block. Because our main results correspond to mean variables (e.g., expected firm value), we expect them to hold as long as such an effort function continues to be increasing, the linear case being the simplest. In fact, a key takeaway of our analysis is that we uncover a novel finding regarding the nature of strategic trading (Theorem 1) that does not rely on technological considerations, but instead on a natural property: past orders and future terminal positions across players are *strategic complements*. This can be seen clearly in the value of the leader's holdings, $(X_T^L + X_T^F)X_T^L$, in (3). In particular, the higher the leader's terminal position, the more she benefits from inducing a higher position by the follower, because the extra value is applied to more shares.

Sequential Trades. It is often argued that activists reaching the 5% threshold want to act fast to avoid block acquisition becoming too costly. Brav et al. (2008) argue that "[other] hedge funds frequently acquire significant stakes in targets within hours of learning that an initial fund has taken a position" (p. 1757). In turn, Wong (2020) shows that in cases in which activist hedge funds complete their blocks on the trigger date, there is 36% more abnormality in trading by other investors on the same day—a correlation between competition and rapid completion. These threats come from not only hedge funds, but also insiders (e.g., Chabakauri, Fos, and Jiang (2025)) and other investors through brokers (e.g., Di Maggio et al. (2019)).

The sequential structure is thus natural, and also supported by our earlier discussion of (i) an average of 1% shares outstanding being purchased during the disclosure window, and (ii) most of these purchases happening on the trigger date: the sizable purchases make evading competition of utmost importance, and such purchases are indeed completed fast.[13] Section IV is devoted to examining competitive effects and the incentives to move first.

II. Activist Trading

In this section, we derive the equilibrium trading strategies of our activists. We note that finding equilibria in environments exhibiting strategic block

[12] Nontrivial intensive margins are also at play when activism focuses on reallocating resources. See Brav, Jiang, and Kim (2015) and Brav et al. (2018) in the case of production plants and patents, respectively.

[13] A goal of 6% ownership once crossing 5% facilitates quick block completion. While smaller blocks reflect hedge funds' desire to only influence firms, this choice is also driven by important ownership costs above 10%: the "short swing rule" (Section 16(b) of the Securities Act) can force a hedge fund to return any profits from reversal trades over a 6-month period. Insider trader rules also put limitations on trading.

accumulation and endogenous firm values is in general a difficult task—this issue has been noted in prior literature, and presumably explains the scarcity of results when it comes to multiplayer analyses.[14] To these features, we add interdependent private information and sequential trading, which makes the environment asymmetric across traders.

A. Equilibrium Construction and Main Result

The first step for finding the coefficients in the activists' strategies is to compute players' beliefs about each other under the assumption that their counterparties are following linear trading strategies: the market maker's beliefs about the firm's value $X_T^L + X_T^F$ determine prices, and hence the activists' costs of block acquisition; in turn, each activist needs to predict how the other one trades—based on a private block—to correctly assess their trading gains. With normally distributed blocks and noise, as well as linear strategies, these beliefs are routine applications of the traditional projection theorem for Gaussian random variables.

LEMMA 1: *Suppose that the activists follow (4). Prior to trading, the firm's share price is*

$$P_0 = \frac{\mu(2 + \alpha_L + \alpha_F + \delta_L + \delta_F)}{1 - \beta_F}, \tag{5}$$

while each activist updates their belief about the other's initial position according to $Y_0^i := \mathbb{E}[X_0^{-i}|X_0^i] = \mu + \frac{\rho}{\phi}(X_0^i - \mu)$ *and* $\nu_0^i := \text{var}(X_0^{-i}|X_0^i) = \phi - \frac{\rho^2}{\phi}$, $i \in \{L, F\}$. *Then:*

- *At* $t = 1$, *the leader's trade is executed at price* P_1, *which obeys*

$$P_1 = P_0 + \Lambda_1\big[\Psi_1 - (\alpha_L + \delta_L)\mu\big], \text{ where} \tag{6}$$

$$\Lambda_1 := \frac{\alpha_L \phi}{\alpha_L^2 \phi + \sigma^2} \times \frac{1 + \alpha_L + \rho(1 + \alpha_F)/\phi}{1 - \beta_F}. \tag{7}$$

Meanwhile, the follower updates his belief about the leader's terminal position using Ψ_1. *We denote this belief by* $Y_1^F := \mathbb{E}[X_T^L|X_0^F, \Psi_1]$, *which satisfies*

$$Y_1^F = (1 + \alpha_L)Y_0^F + \delta_L\mu + \frac{(1 + \alpha_L)\alpha_L \nu_0^F}{\alpha_L^2 \nu_0^F + \sigma^2}\big\{\Psi_1 - (\alpha_L Y_0^F + \delta_L\mu)\big\}. \tag{8}$$

- *At* $t = 2$, *the follower's trade is executed at price* P_2, *which obeys*

[14] See Edmans and Holderness (2017, pp. 579, 625) on the importance of making trades depend on block size in blockholder models, and on how the binary firm values typically assumed for tractability in corporate finance models implicitly restrict trades to exogenous amounts independent of initial blocks.

$$P_2 = P_1 + \Lambda_2[\Psi_2 - \alpha_F M_1^F - \beta_F P_1 - \delta_F \mu], \text{ where} \tag{9}$$

$$\Lambda_2 := \frac{\alpha_F \gamma_1^F}{\alpha_F^2 \gamma_1^F + \sigma^2} \times [1 + \alpha_F + \rho_1(1+\alpha_L)/\gamma_1^F]. \tag{10}$$

In (9) and (10), M_1^F and γ_1^F denote the mean and variance of the market maker's belief about the follower's initial position given Ψ_1, while ρ_1 denotes the contemporaneous updated covariance of initial positions (see (A3) and (A4) in the Appendix).

The initial price P_0 is what the leader is quoted before placing an order—it results from the market maker's forecast of the activists' terminal positions under (4) and the prior belief about initial blocks before any trading takes place.[15] Importantly, its denominator encodes a *feedback effect* from the financial market to the firm's fundamentals: from a time-0 perspective, if higher first-period prices lead to more purchases by the follower, the firm becomes more valuable, which further reinforces the price, and so forth. Finally, note that due to the interdependence at play, the activists must also adjust their prior beliefs about each other before any trading happens. They do so by adjusting their prior using their private blocks, which results in a new mean and variance denoted by Y_0^i and ν_0^i, $i \in \{L, F\}$, respectively.

At $t = 1$, the quoted price P_0 is adjusted in response to the realized order flow Ψ_1, which the market maker assumes is driven by the leader's linear strategy in (4), or $\Psi_1 = \alpha_L X_0^L + \delta_L \mu + \sigma Z_1$, resulting in the *execution price* P_1 that the leader must pay—see (6). In this expression, the price updates in the direction of the unanticipated order flow from the market maker's perspective, or $\Psi_1 - \mathbb{E}[\Psi_1|\mathcal{F}_0] = \Psi_1 - (\alpha_L + \delta_L)\mu$. Meanwhile, the intensity of the response, Λ_1—or *price impact*, given by (7)—is deterministic and computed using the regression coefficient formula

$$\Lambda_t = \frac{\text{cov}(X_T^L + X_T^F, \Psi_t)}{\text{var}[\Psi_t]} \tag{11}$$

applied to $t = 1$. Readers familiar with Kyle (1985) will recognize the first ratio in the right-hand side of (7) as the price impact expression if the firm's true value were exogenous according to the leader's initial position. The second ratio is due to the firm's fundamentals being endogenous via trading: the numerator encodes the leader's contribution ($1 + \alpha_L$ term) and to what extent, depending on the correlation, her trades signal a commensurate contribution by the follower ($\rho(1 + \alpha_F)/\phi$ term). In turn, the denominator encodes the aforementioned feedback effect of the stock price directly affecting fundamentals through the follower's trading choices, which shape his effort decision.

Importantly, the follower must also update about the leader at this stage to correctly forecast the firm's value. This is encoded in the follower's belief

[15] We use $P_0 = \mathbb{E}[(1+\alpha_L)X_0^L + \delta_L\mu + (1+\alpha_F)X_0^F + \beta_F P_1 + \delta_F\mu|\mathcal{F}_0]$ and $\mathbb{E}[P_1|\mathcal{F}_0] = P_0$.

Y_1^F in (8), which revises his initial forecast of the leader's terminal position, $(1+\alpha_L)Y_0^F+\delta_L\mu$, using the realized first-period order flow Ψ_1; we will elaborate on this belief shortly, which plays an important role in our analysis. What matters for now is that, as the follower enters the second period with this estimate, he is quoted a price P_1 per share, which the market maker updates in response to the realized second-period order flow under the assumption that $\Psi_2=\alpha_F X_0^F+\beta_F P_1+\delta_F\mu+\sigma Z_2$. This results in the execution price P_2, as in (9), that the follower pays. The logic is exactly as before. First, the unanticipated order flow now requires predicting the follower's trade: the market maker resorts to (M_1^F,γ_1^F), which estimates the follower's initial block given Ψ_1.[16] Second, price impact Λ_2 is again derived from (11) using the follower's strategy driving Ψ_2 and updated covariance ρ_1 and variance γ_1 terms: the first ratio in (10) is the analog of the first ratio in (7), while the second term relates to the firm's value being affected by trading—the absence of a denominator is due to the leader not trading again in this baseline model (i.e., the feedback channel operates only through Ψ_1 influencing the follower).[17]

Equipped with prices and activists' beliefs, we can set up best-response problems for our activists. To this end, recall that activist i's ex post payoff is given by

$$\underbrace{(X_T^i+X_T^{-i})X_T^i}_{\text{total value of block}}-\underbrace{P_{t(i)}\theta^i}_{\text{trading costs}}-\underbrace{\frac{1}{2}(X_T^i)^2}_{\text{activism costs}},\quad i\in\{L,F\}.$$

Each activist will then decide how much to trade taking as given (i) their counterparty's trading strategy and (ii) prices as in Lemma 1. Letting $\mathbb{E}_i[\cdot]$ denote the expectation operator of activist i at the time they decide how to trade, and using $\Psi_{t(i)}=\theta^i+\sigma Z_{t(i)}$ in the expressions for prices (6) and (9) when activist i places order θ^i, $i\in\{L,F\}$, the activists' optimal trades satisfy the following first-order conditions (FOCs):

$$\textit{follower}:\quad \theta^F\Lambda_2=\mathbb{E}_F[X_T^F+X_T^L]-\mathbb{E}_F[P_2],$$

$$\textit{leader}:\quad \theta^L\Lambda_1=\mathbb{E}_L[X_T^F+X_T^L]-\mathbb{E}_L[P_1]+X_T^L\frac{\partial\mathbb{E}_L[X_T^F]}{\partial\theta^L}.$$

Consider the first condition. The follower's optimal order must equate the cost of having market power—the left-hand side, which indicates that as the price responds with sensitivity Λ_2, all inframarginal units become more expensive—with the per-unit trading gain from his perspective—the right-hand side, which captures the net gain on each unit purchased due to the

[16] This belief differs from the prior (μ,ϕ) if and only if there is correlation (i.e., if $\rho\neq 0$).

[17] These expressions hold on and off the equilibrium path, as an activist's trades are hidden from others. Note also that the leader does not need to update about the follower after observing Ψ_2.

follower's superior information.[18] Importantly, it is easy to conclude from here that, in equilibrium, the follower's trade must be unpredictable from the market maker's perspective—his order is expected to be zero, or $\mathbb{E}[\theta^F|\mathcal{F}_1] = 0$, as is usual in Kyle-type models.[19]

Inspection of the leader's FOC above reveals analogous terms, and so any departure from this canonical way of trading by the leader must be driven by the last term in that equation, or

$$X_T^L \frac{\partial \mathbb{E}_L[X_T^F]}{\partial \theta^L}, \tag{12}$$

which is a nontrivial continuation value capturing the idea that the leader's incentives to trade are also influenced by the possibility of inducing the follower to build a larger terminal block and hence to exert more effort. In what follows, we refer to (12) as the *value of manipulation* because it encodes the value associated with influencing a real action—effort provision—by strategically affecting beliefs, which shape the follower's gains from trading.

To better understand this latter channel, insert $X_T^F = \theta^F + X_0^F$ and $P_2 = P_1 + \Lambda_2[\theta^F - \mathbb{E}[\theta^F|\mathcal{F}_1] + \sigma Z_2]$ into the follower's FOC. Solving for θ^F, and using that the follower's trades are unpredictable in equilibrium, we obtain

$$\theta^F = \frac{Y_1^F + X_0^F - P_1}{2\Lambda_2 - 1}, \tag{13}$$

where Y_1^F is the follower's expectation of the leader's terminal position from Lemma 1. The trade-off that the leader faces is clear. On the one hand, by creating greater order flow, a larger trade indicates that the leader will exert more effort, which increases the follower's motive to trade through Y_1^F. But the market maker understands this logic and increases the price P_1 quoted to the follower, which weakens his incentive to trade.

Equipped with this, imposing that the optimal strategies from the FOCs coincide with the linear strategies (4) leads to fixed-point equations for the coefficients $(\alpha_L, \delta_L, \alpha_F, \beta_F, \delta_F)$. The system is complex not only because of the asymmetry in the coefficients (due to the timing of moves), but also because the system must be augmented to check nontrivial second-order conditions (SOCs) stemming from the endogeneity of the fundamentals:

$$\textit{follower}: \quad 0 > 1 - 2\Lambda_2, \tag{14}$$

$$\textit{leader}: \quad 0 > 1 - 2\Lambda_1(1 - \beta_F). \tag{15}$$

[18] Note that here and in the leader's condition, the change in firm value due to a marginally larger terminal block is absent due to effort choices being at an optimum.

[19] Indeed, this follows from the market maker having correct beliefs in equilibrium and the law of iterated expectations, that is, $\mathbb{E}[\mathbb{E}_F[X_T^L + X_T^F - P_2]|\mathcal{F}_1] = \mathbb{E}[X_T^L + X_T^F - \mathbb{E}[X_T^L + X_T^F|\mathcal{F}_2]|\mathcal{F}_1] = 0$.

The right-hand side of (14) appears in the denominator of (13). In equilibrium, therefore, increasing Y_1^F (or P_1) moves the follower's trades in the direction discussed. Crucially, the leader's SOC is nontrivial because of the term $1 - \beta_F$, which reflects how the leader's *effective cost of trading* is affected by the feedback at play: if large trades cause the follower to acquire a bigger block, these trades are less costly for the leader than in a setting with exogenous fundamentals where price impact is the only disciplining force. This can happen when β_F—the weight that the follower attaches to P_1 in his strategy—is less than but close to one.[20]

Toward our main result, let

$$\alpha^K := \sqrt{\frac{\sigma^2}{\phi}}$$

denote the well-known slope coefficient in the traditional Kyle insider trading strategy.

THEOREM 1: *There exists a $\underline{\rho} \in (-\phi, 0)$ such that for all $\rho \in (\underline{\rho}, \phi]$, a PBS equilibrium exists.*

(i) If $\rho > 0$, the leader sells on average: $-\delta_L > \alpha^K > \alpha_L > 0$, so $\mathbb{E}[\theta^L|\mathcal{F}_0] < 0$.
(ii) If $\rho < 0$, the leader buys on average: $\alpha_L > \alpha^K > -\delta_L > 0$, so $\mathbb{E}[\theta^L|\mathcal{F}_0] > 0$.

By contrast, $\mathbb{E}[\theta^F|\mathcal{F}_1] = 0$ for all ρ. Furthermore, the equilibrium coefficients in the follower's strategy satisfy $\alpha_F = \sqrt{\sigma^2/\gamma_1^F}$, $\delta_F < 0$, and $\beta_F < 1$, with $sign(\beta_F) = -sign(\rho)$. Finally, only when $\rho = 0$ does $\alpha_L = -\delta_L = \alpha^K$ hold; in this case, $\theta^i = \alpha^K(X_0^i - \mu)$, $i = L, F$.[21]

From the result, predictability is a *generic property* of the leader's trading: $\mathbb{E}[\theta^L|\mathcal{F}_0] \neq 0$ if and only if $\rho \neq 0$. This property admits two interpretations. From a governance perspective, when activists know more about each other than the public knows, a leader's accumulation of shares departs meaningfully from that arising when she acts in isolation, in which case the value of manipulation would be absent—as we will show, this can have nontrivial implications for firm value and prices (Section III.B). From a theoretical perspective, the result confirms that the strategic motive of a trading activist differs from that of insider traders who do not directly influence firms. We emphasize average trades as a key measure of interest (as opposed to ex post trades) because they are the cleanest outcome variable through which our stylized model speaks to both governance and strategic considerations. That said, while there

[20] The scalar one in (14) and (15) reflects a convexity linked to trades affecting firm value via effort choices.

[21] More generally, one can show that $\theta^F = \sqrt{\frac{\sigma^2}{\gamma_1^F}}(X_0^F - M_1^F)$, where (M_1^F, γ_1^F) are defined as in Lemma 1. We can prove uniqueness of PBS equilibria analytically for $\rho \in (\rho_0, \phi]$, where $\rho_0 \in (\underline{\rho}, 0)$. Numerically, uniqueness within the PBS class seems to hold for $\rho \in (\underline{\rho}, \rho_0]$. The threshold $\underline{\rho}$ depends on parameters.

is selling pressure on average when $\rho > 0$, leaders with large blocks do acquire more shares as long as $\alpha_L X_0^L + \delta_L \mu > 0$.

It may seem intuitive that the leader's block-building incentives can be weakened, as less-aggressive trades can be used to lower the price P_1 that the follower is quoted, a force that would increase his trading gains. The issue is that, by placing a smaller or negative order, the follower also becomes more pessimistic about the leader's contribution to the firm's value (i.e., Y_1^F can fall). To make the matter more stark, consider what happens when $\rho < 0$. In this case, the leader buys on average, driving P_1 up, but the follower buys more shares as P_1 increases: from Theorem 1, $\beta_F > 0$ in the follower's strategy when $\rho < 0$.

At the center of our finding is the *differential sensitivity* of the follower's and market maker's beliefs resulting from the interdependence at play: because the informational content of order flows varies across the follower and the market maker, market signals can be used to communicate with, and influence, others. To see how this mechanism operates, use the expression for the follower's order (13) and $\Psi_1 = \theta^L + \sigma Z_1$ to write the value of manipulation (12) as

$$X_T^L \frac{\partial \mathbb{E}_L[X_T^F]}{\partial \theta^L} = \frac{X_T^L}{2\Lambda_2 - 1}\left[\frac{\partial Y_1^F}{\partial \Psi_1} - \frac{\partial P_1}{\partial \Psi_1}\right], \tag{16}$$

where the bracket captures how the follower's informational advantage, embedded in her perceived trading gains, is affected by the first-period order flow. The follower then views an unexpectedly large Ψ_1 as a signal that only the leader will exert more effort because the follower privately knows his own willingness to intervene. But since the market maker is uncertain about both *the leader's and the follower's* contributions, correlation matters. If $\rho > 0$, the market maker infers that the follower will contribute more value too, so P_1 reacts more strongly to Ψ_1 than Y_1^F (established below). As (16) becomes negative, reflecting that a positive surprise in Ψ_1 discourages block acquisition by the follower, the leader's incentives to acquire stock fall. Conversely, if $\rho < 0$, P_1 reacts less strongly to Ψ_1 than Y_1^F: for the market maker, signals that indicate larger contributions by the leader are offset by a perception of smaller contributions by the follower. With relatively less sensitive prices, the value of manipulation is now positive—the leader buys more aggressively to increase the follower's trading gains by inducing more mispricing that can be exploited.

Only when $\rho = 0$ do the sensitivities above coincide: absent any interdependence, both the follower and the market maker only update about the leader's effort from Ψ_1, and with the same intensity given the common prior. In this knife-edge case, the usual trading strategy in "gap" form $\alpha^K(X_0^i - \mu)$, $i \in \{L, F\}$, emerges, as the final part of Theorem 1 shows. The left panel in Figure 1 illustrates typical coefficients in the leader's strategy. In turn, the right panel plots the sensitivities $\partial Y_1^F/\partial \Psi_1$ and $\partial P_1/\partial \Psi_1 = \Lambda_1$.[22]

[22] Section VII in the Internet Appendix contains a list of figures and their source codes, all of which can be found in the replication package.

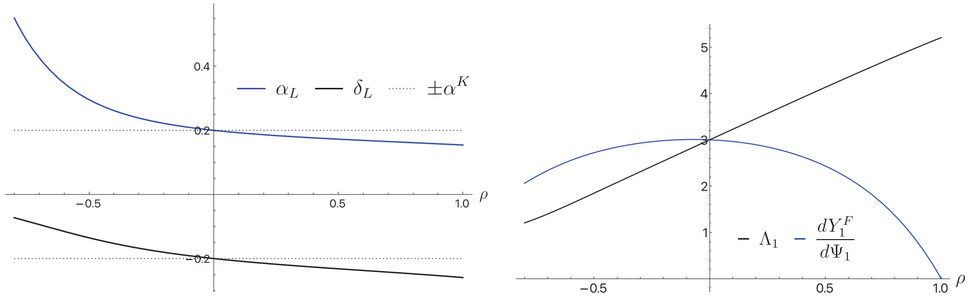

Figure 1. Left panel: leader's strategy coefficients, along with $\alpha^K := \sqrt{\sigma^2/\phi}$. Right panel: sensitivities of P_1 and Y_1^F with respect to Ψ_1. Parameters values: $\phi = 1$, $\sigma = 0.2$. (Color figure can be viewed at wileyonlinelibrary.com)

We conclude with two observations related to this figure. First, in the left panel, the departures from the levels $\pm\alpha^K$ capture the extent of manipulation by the leader: if $\rho > 0$, the leader underweighs the importance of her block in her strategy in favor of the prior mean μ to generate downward pressure on prices. In practice, this means that leaders with larger blocks distort their purchases more in absolute terms because the gains from influencing the follower are applied to more shares. Furthermore, as $|\rho|$ grows, the deviation is more acute because the first-period order flow becomes statistically more informative (for better or worse) about the follower's contribution.[23] The observed asymmetry in the departures for positive and negative ρ is due to the differential effect of the feedback channel on the convexity of the leader's problem—it relates to the threshold $\underline{\rho} < 0$ for existence as we discuss in Section V below.

Second, related to the right panel, a direct corollary of Theorem 1 is that

$$\text{sign}\left(\frac{\partial Y_1^F}{\partial \Psi_1} - \frac{\partial P_1}{\partial \Psi_1}\right) = \text{sign}(\beta_F) = -\text{sign}(\rho),$$

and so the sensitivities of P_1 and Y_1^F to Ψ_1 rank as we anticipated.[24] This also explains why Y_1^F does not need to be carried independently in the follower's strategy: the contributions of Y_1^F and P_1 are subsumed in $\beta_F P_1$ because Y_1^F is linear in Ψ_1 and hence affine in P_1.

[23] The observed decreasing patterns are established in Proposition A6 in the Appendix.

[24] The last equality comes from Theorem 1. As for the first, use (12) under $\theta^F = \alpha_F X_0^F + \beta_F P_1 + \delta_F \mu$ to obtain $X_T^L \frac{\partial \mathbb{E}_L[X_T^F]}{\partial \theta^L} = X_T^L \beta_F \Lambda_1$ and equate the expression to (16). The result then follows from the SOCs holding and $\beta_F < 1$ (also from Theorem 1, which, through the leader's SOC, implies that $\Lambda_1 > 0$).

B. Robustness

We now briefly discuss model variations that deliver qualitatively identical results.

Other Forms of Private Information. As we argue above, the fact that private information corresponds to initial blocks is not essential when it comes to the type of strategic behavior uncovered.

PROPOSITION 1: *Suppose that the activists' initial blocks are public. Consider the following variations of our model (in each case, the rest of the assumptions remain unchanged):*

- *(i) Exogenous components of firm value: The firm's (share) value is $V^L + V^F + W^L + W^F$, where $V^i \sim \mathcal{N}(\mu, \phi)$ is exogenous and is activist i's private information, $i \in \{L, F\}$.*
- *(ii) Activist productivity: Activist i's cost of effort is $\frac{(W^i)^2}{2} - \zeta_i W^i$, where $\zeta^i \sim \mathcal{N}(\mu, \phi)$ is exogenous and is activist i's private information, $i \in \{L, F\}$.*

Let $\rho := \text{cov}(\xi^L, \xi^F)$, $\xi \in \{V, \zeta\}$. Then, as long as ρ is positive or not too negative, if $X_0^L > 0$ there is an equilibrium with $\mathbb{E}[\theta^F|\mathcal{F}_1] \equiv 0$ and sign$(\mathbb{E}[\theta^L|\mathcal{F}_0]) = -$sign$(\rho)$ in both (i) and (ii).

Both variations capture "activist expertise": in part (i), the activists can be seen as each having superior information about a different division of the target; in part (ii), ζ captures an activist's ability to unlock firm value at lower private costs.[25] In either case, the logic behind the relationship between the underlying correlation and the leader's average trade is preserved: her terminal position continues to be her private information and, as it increases in $X_0^L > 0$, leaders with larger initial blocks benefit more from the follower's effort.[26]

The Leader Trades Again. Because the leader continues to have relevant private information in the second period, she may benefit from trading once again along with the follower. Figure 2 contrasts the leader's average trade in the first period of such a model with that in our baseline model as a function of ρ, showing that a qualitatively identical distortion from a neutral trade arises too. The magnitude of the departure is smaller though, due to a competition effect: as the follower scales back in response to the presence of the leader at $t = 2$, this reduces the value of manipulation for the leader activist in the first period. (For more details on this extension, see Internet Appendix Section I.D.)

[25] Brick et al. (2024) study how hedge funds' industry experience affect activism.

[26] In these variations, leaders with larger (now public) initial blocks can buy less shares than smaller blockholder counterparts; see (A30), which features a negative weight on X_0^L if $\rho > 0$. While this force was present in a PBS equilibrium when blocks were private, it was counteracted by a block being used as a source of informational advantage. See also (A31) for the leader's terminal position being increasing in X_0^L.

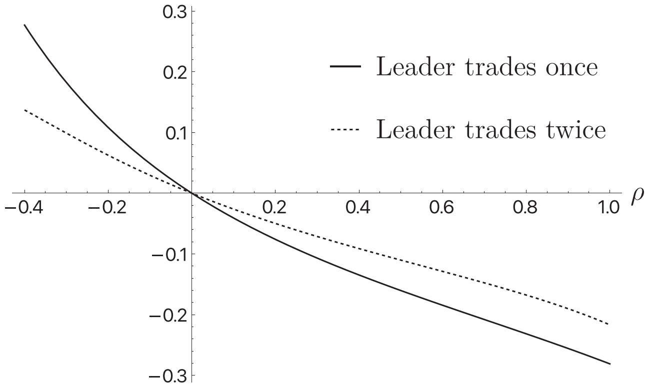

Figure 2. Leader's expected period-one trade. Parameter values: $\mu = \phi = 1$, $\sigma = 0.8$.

Section IV expands on variations of this competition theme (for instance, by varying the number of followers). For now, the bottom line is that our choice of model is purely driven by tractability reasons, bringing us to the next point.

Repeated Trades with Both Activists. With activists who trade in sequence, and only once each, the presence of correlation is key to generating the intertemporal effect studied. But this is not needed with multiple rounds of trading featuring both activists in all rounds.

PROPOSITION 2: *Suppose that both activists trade in each of the two rounds prior to the effort stage, and that initial blocks are as in the baseline model with* $\rho \geq 0$*. If* $\sigma > 0$ *is sufficiently small, there is a linear equilibrium in which both activists (strictly) sell on average at* $t = 1$.

Here, again, each activist can learn about their counterparty's contribution to the firm while the market maker cannot disentangle the individual contributions—but our mechanism can emerge *even if there is no correlation*. Indeed, while the market maker relies on the total order flow to learn about the firm, the activists can construct a residual signal net of their own trading to learn about their counterparty because they know how their own trades add to the order flow. As the former signal has more fundamental uncertainty—because it carries two pieces of unknown information—prices are relatively more sensitive even when $\rho = 0$. This model is considerably more complex, so we prove existence around $\sigma = 0$, which simplifies the equilibrium conditions. See Section I in the Internet Appendix for details.

The key conclusion from this exercise is that, for our mechanism to emerge, the activists just need to have a better ability than the market maker to filter information about each other—the initial correlation in the baseline model being one possibility. We discuss related evidence on this topic in Section IV.C, where we take a more institutionally oriented view.

Passive Leader. If the leader instead does not exert effort, thus behaving like a passive fund, the same mechanism ensues. We prove the following in Internet Appendix Section II.

PROPOSITION 3: *Consider our baseline model but with only the follower exerting effort. Then, the leader sells on average for all $\rho \neq 0$. Instead, if private information is about exogenous components of the firm as in Proposition 1(i) and ρ is positive or not too negative, then there is a linear equilibrium featuring $sign(\mathbb{E}[\theta^L|\mathcal{F}_0]) = -sign(\rho)$.*

If the leader does not intervene, there is nothing to learn about her input to the firm; but as long as blocks are correlated, Ψ_1 informs the market maker about the follower's contribution. Thus, Y_1^F ceases to be payoff relevant for the follower, while P_1 responds to Ψ_1 so long as $\rho \neq 0$, causing the leader to sell on average. In turn, buy orders reemerge if private information is about exogenous fundamentals and negatively correlated: the follower can learn about the firm's value from the first-period order flow, so Y_1^F—his forecast of V^L known by the leader—now responds to Ψ_1, and the usual logic applies.[27]

Friendliness toward the Firm. Some blockholders are friendly to firms, resisting the change brought about by activists. To capture such a conflict, we add $\kappa X_T^L W^F$, $\kappa \in (0, 1)$, to the follower's quadratic effort costs: effort W^F by the follower—for example, in supporting the leader's campaign—entails losses that grow with the leader's terminal block—for example, losing more private benefits as the leader's degree of control grows. For expositional clarity, we keep the leader's payoffs unchanged (i.e., the leader is benevolent in that she does not obtain additional private benefits).

The follower's effort now becomes $X_T^F - \kappa Y_1^F$, with the second term encoding *negative activism*: engaging in actions that lower firm value, or that oppose the leader's value-enhancing change, in proportion to his expectation of the leader's contribution. In this situation, trading aggressively is costly to the leader not only because of price impact, but also because the firm's *true* value $X_T^L + X_T^F - \kappa Y_1^F$ moves against the leader due to the follower's counteraction. This channel is nontrivial because it may seem that a drop in fundamentals due to a marginal increase in Ψ_1 boosting Y_1^F is perfectly offset by an identical change in the price $P_1 = \mathbb{E}[X_T^L + X_T^F - \kappa Y_1^F|\mathcal{F}_1]$. However, there is an important difference: price changes apply to newly acquired shares only, while negative activism applies to the entire block. To protect the value of her *initial block* from the follower's negative activism then, the leader reduces her block acquisition, thereby signaling to the follower that only moderate change is coming. Importantly, this phenomenon is most transparent when $\rho = 0$, a situation where it is not possible to affect the follower's behavior through influencing his trading gains.

[27] If the leader in our baseline specification is passive, it is possible to show that a linear equilibrium exhibiting selling pressure exists for all negative values of ρ. See the Internet Appendix for details.

PROPOSITION 4: *When facing a follower, that is, friendly to the firm as above, the leader always sells on average in the first period when* $\rho = 0$.

Section III in the Internet Appendix contains the proof and additional details of this example. In particular, Figure IA1 shows that this new effect amplifies the mechanism already present in the baseline model, that is, the leader's benefit of reducing her purchases when correlation is positive.

III. Predictions

The predictability of trades determines the extent to which initial blocks are expected to change and hence speaks to the question of whether ex ante trading promotes or suppresses activist interventions via costly "voice." Because stock prices reflect the market's expectation of firms' true values, our model can link block interdependence, via the implied predictability of trades, with average prices during activism events. We first present theoretical results pertaining to market outcomes in our model. We then connect these findings with the existing empirical literature.

A. Market Outcomes

Returning to our baseline model, we examine market outcomes from an ex ante perspective, that is, we average across all possible blocks for the leader and follower.[28] To simplify notation, we write $\mathbb{E}[\cdot]$ for $\mathbb{E}[\cdot|\mathcal{F}_0]$, which averages using the prior distribution of blocks, and note that $\mathbb{E}[X_T^F] = \mathbb{E}[X_0^F] = \mu$ because the follower's trades are neutral on average. Thus, only the leader ends up nontrivially affecting the firm's value through her trading. It is easy to then see that the firm's ex ante value and price satisfy $\mathbb{E}[W^L + W^F] = \mathbb{E}[P_1] = \mathbb{E}[P_2] = (2 + \alpha_L + \delta_L)\mu$. Recall that $\mu > 0$.

THEOREM 2: *In any PBS equilibrium:*

- *(i) Governance and interdependence:* $\mathbb{E}[W^L + W^F] \leq 2\mu$ *if and only if* $\rho \geq 0$ *(with strict inequality if* $\rho \neq 0$*). Furthermore, ex ante firm value monotonically decreases with* ρ.
- *(ii) Efficacy of multiplayer attacks:* $\mathbb{E}[W^L + W^F] > \mu$ *for all* ρ *such that a PBS equilibrium exists (i.e.,* $\rho > \underline{\rho}$*, where* $\underline{\rho}$ *is as in Theorem 1).*
- *(iii) Effect of market liquidity: Fix* $\rho > 0$.
  - *(iii.1) Both* $\lim_{\sigma \to +\infty} \mathbb{E}[\theta^L]$ *and* $\lim_{\sigma \to +\infty} (\alpha_L - \sqrt{\sigma^2/\phi})$ *exist and take a negative value.*

[28] While selection effects can be at play in activism events, this measure is not an unreasonable approximation. On the one hand, while small blockholders may be perceived as less relevant, they are gaining prominence. Brav, Jiang, and Li (2022) document an example of a hedge fund that owns 0.02% of outstanding stock obtaining important concessions. On the other hand, the largest blockholder in a firm typically is a passive fund, and the largest blockholders are less likely to trade (e.g., Lewellen and Lewellen, 2025).

(iii.2) $\lim_{\sigma\to 0} \mathbb{E}[\theta^L] = 0$ *and* $\lim_{\sigma\to 0}(\alpha_L - \sqrt{\sigma^2/\phi}) = 0$.

The first part of the theorem illustrates how the leader's behavior amplifies or mitigates the static free-riding incentives that are inherent in multiplayer engagements. Specifically, absent any trading, ex ante firm value amounts to $\mathbb{E}[X_0^L + X_0^F] = 2\mu$ due to each activist exerting effort according to their own block. When correlation is positive and the leader sells on average, firm value falls below this benchmark—the leader effectively offloads activism costs on the follower, and the extent of free-riding grows. Conversely, when correlation is negative, the leader is inevitably forced to bear more of the activism costs and develop more skin in the game to entice the follower to build his block—remarkably, the manipulation at play now mitigates the extent of free riding. The last part of (i) simply says that we can analytically show that the inefficiencies grow as ρ increases.

Turning to (ii), note that when only one activist is present—and hence the manipulation motive is trivially absent—trades are unpredictable and ex ante firm value is μ. The theorem then asserts that multiplayer engagements always deliver more value than single-player attacks. By "always," we mean irrespective of the value of ρ, and hence independent of whether the free-riding motive is exacerbated. This is a result of the leader not reversing her initial position on average (i.e., $\text{sign}(\mathbb{E}[X_0^L]) = \text{sign}(\mathbb{E}[X_T^L])$), which would be needed for the firm's value to fall below the single-player case. In other words, despite the manipulation, the leader is effectively engaged in positive activism in this type of equilibrium.

Finally, part (iii) explores the effect of order flow volatility when $\rho > 0$; we use limiting values of σ to obtain analytical comparisons. As the market becomes more liquid when σ grows, the price P_1 is less responsive to the order flow, suggesting that less manipulation is optimal. But fundamentals are endogenous—as the leader trades more aggressively due to her limited ability to move prices, she builds a larger terminal block. Through this channel—the leader's marginal incentive to manipulate, captured by X_T^L, being endogenous—the value of manipulation grows, despite the lower price impact of trades. This is what part (iii.1) states: as σ grows large, there is a nontrivial degree of manipulation in that $|\alpha_L - \sqrt{\sigma^2/\phi}| \neq 0$ in the limit, a situation in which the leader sells a finite amount. Conversely, when $\sigma \searrow 0$ and the market is infinitely illiquid, the leader naturally ceases to trade at all (part iii.2).

Figure 3 extends (iii) for intermediate values of σ and for a negative ρ: the leader's expected trade (also a measure of manipulation), $(\alpha_L + \delta_L)\mu$, increases in magnitude monotonically as σ grows.

B. Connection with the Empirical Evidence

The empirical literature on activism focuses on examining trading volume and prices around disclosure events to assess the real effects of this practice. The challenge with multiplayer attacks, however, is that not all of the activists

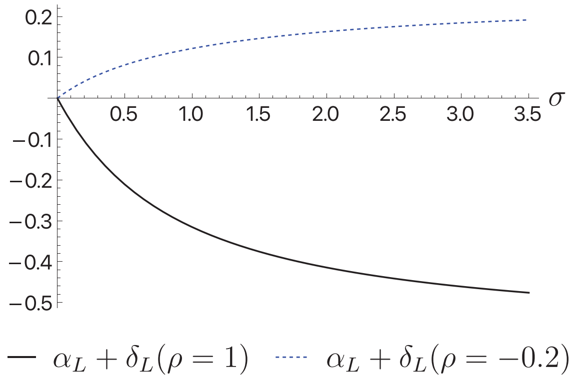

Figure 3. The leader's expected trade as a function of σ for two levels of correlation: $\rho = 1$ (solid) and $\rho = -0.2$ (dashed). When $\rho > 0$, the limit is finite as $\sigma \to \infty$. Parameter values: $\phi = \mu = 1$. (Color figure can be viewed at wileyonlinelibrary.com)

involved have to disclose their positions. Thus, prior analyses on this topic either examine events featuring multiple funds with publicly known positions or employ indirect methods to infer properties of multiactivist interactions.

In the first category, most closely related to the current study is Becht et al. (2017), who examine activism events featuring disclosing hedge funds in attacks in Asia, Europe, and the United States. Of the 1,740 events in their sample, a quarter involve multiple activists targeting the same firm. A key finding is that these events perform "strikingly better" (p. 2933) than their single-player counterparts—their accumulated total stake as a whole is larger, and so are the abnormal returns observed. These findings are consistent with our robust finding in Theorem 2(ii) that multiplayer engagements add more value for all ρ as in Theorem 1.

In terms of indirect methods, the closest evidence in favor of our mechanism is provided by Flugum, Lee, and Souther (2023), who identify institutional investors that access EDGAR files of specific activists' targets in the days prior to 13D filings.[29] There are three key findings about trading patterns in the presence of such "informed followers." First, disclosing activists tend to acquire more shares before these followers access files, with over 95% of an activist's purchases being free from these followers' competitive threat—i.e., trades happen in sequence. Second, these followers are more likely to increase their holdings before filing occurs, consistent with informational advantages driving block formation. Third, when these followers are present, activists are less likely to increase their stakes beyond those reported in the initial filing. This finding, while pertaining to block acquisition after disclosure, resembles the substitution effect arising when $\rho \geq 0$ in our model—as followers develop skin in the game, an activist's need to continue growing her block, say, to ensure winning a campaign, is weakened.

[29] They do so by identifying institution-owned IP addresses that download such information.

We conclude this section by discussing one possible avenue that the empirical literature can pursue based on our work. The starting point is that our model delivers price patterns analogous to abnormal buy-and-hold returns observed around disclosure events. Indeed, note that if activism is not at play, fundamentals are exogenous from the activists' perspective—trades should be neutral on average because they must respond to informational advantages only. As blocks should not change on average in such "normal" times, the average price would be 2μ. But our findings point to average prices that depart from this benchmark when activism is possible. Specifically, by Theorem 2(i), prices should be *abnormally low when* $\rho > 0$, *and vice versa*; stated in relative terms, *abnormal returns should fall as* ρ *grows*.

The empirical challenge then is to identify characteristics of target firms with enough underlying variation in block interdependence to test the hypothesis above. Market capitalization can be one such variable, which can be exploited by leveraging the work on blockholder interdependence of Hadlock and Schwartz-Ziv (2019). In particular, while these authors document an overall negative interdependence among blockholders of a variety of classes, this conclusion reverses for a subset of "strategic investors" including hedge funds and private equity—the likelihood of observing a block belonging to this investor type increases when a block from the same category is present at a firm. Furthermore, the authors show that this positive interdependence is stronger as the associated blocks become smaller.[30] At the same time, however, Lewellen and Lewellen (2025) document that in the United States, the average (institutionally owned) block size falls with capitalization, at least from mid- to large-cap firms in the United States.[31] A second characteristic therefore could be to account for the presence or absence of short positions, as a mix of blockholders with long and short positions in our model is more likely when correlation is negative. Furthermore, consistent with the previous discussion, highly shorted stocks tend to come from small-cap firms (e.g., Asquith, Pathak, and Ritter, 2005) and to exhibit more disagreement about their prospects (e.g., Diether, Malloy, and Scherbina, 2002).

Taken together, these facts can be taken as suggestive of positive (negative) interdependence increasing (weakening) as market capitalization grows, or as short positions are less frequently observed, which in our model would mean gradually lower abnormal returns. This is exactly what Brav, Jiang, and Li (2022) find for activist hedge funds between 1994 and 2018 in the United States: around disclosure and trigger dates, there is substantially more abnormality for small-cap firms, followed by midcap and then the largest firms (even featuring negative abnormality in this latter case). Our prediction is also

[30] See table C.1 in their Appendix for blocks above 5% and 10%.

[31] From table 3 in their paper, which encompasses institutional investors beyond hedge funds, (i) the largest, (ii) top 2 and 3, and (iii) the top 4 to 10 blockholders in midcap firms have larger fractional holdings on average than their counterparts in large-cap firms. Brav et al. (2008) argue that blocks are smaller in large-cap firms due to the funds needed to acquire a sizable stake in this segment growing considerably.

in line with Li, Saffi, and Yang (2022), who show that when target firms feature investors with large short positions, the abnormal returns are higher than those observed when these investors are absent.

That being said, it is important to acknowledge that these studies do not perfectly fit our setup. For example, hedge funds and private equity are commingled in Hadlock and Schwartz-Ziv (2019), and the firms analyzed need not be targets of activist campaigns, while in Li, Saffi, and Yang (2022) the investors holding negative positions may not actively try to take actions that undermine value (as would occur in our model). However, further investigating this line of inquiry for "trading blockholders"—in particular hedge funds, whose relevance we discuss in Section IV.C—would confirm a fundamental dichotomy at play, namely, their ability to overcome collective-action problems may be substantial in smaller firms but less so in larger ones, purely for strategic reasons.

This conclusion may have meaningful consequences if we expect groups of activists to agglomerate more frequently around large firms. Artiga González and Calluzzo (2019) confirm this type of clustering for hedge funds in geographic proximity and argue that it is consistent with cost-sharing motives. Moreover, as we argue above, activists' interest in these types of firms is growing; in 2024, for instance, megacap firms constituted 30% of major activists' targets.[32]

IV. First-Mover Advantages and Wolf Packs

A. Coordination in the Timing of Trades

To assess the benefit of acting as a leader, we compare trading strategies and payoffs in our model with those in a one-shot trading game in which both activists trade simultaneously.

PROPOSITION 5: *In a symmetric PBS equilibrium of the one-shot game, the activists trade according to* $\theta^i = \sqrt{\frac{\sigma^2}{2\phi}}(X_0^i - \mu)$, $i = L, F$. *Also, there is a region around* $\rho = 0$ *in which, compared to this benchmark, both traders get a higher ex ante payoff if they move sequentially.*[33]

First consider the last part of the result, which corresponds to a *mutually advantageous coordination* of trades—both the leader and the follower can be better off by building blocks in sequence. In Figure 4, this occurs over a wide range of interdependence. To the right of that region, only being a leader pays off: the benefit of being a leader increases with ρ because it is easier to influence the market maker's beliefs and hence more activism costs are offloaded on the follower, while the follower does not have this ability and has the disadvantage of encountering a more informed market maker. To the left of that

[32] See Barclays Global Advisory Group (2025).

[33] Here, there is a negative threshold level of correlation above which a symmetric PBS equilibrium exists and is unique. Indeed, price impact becomes very small when $\rho \ll 0$ due to the two activists' opposing trades, and it cannot offset the convexity from endogenous fundamentals in the players' SOCs.

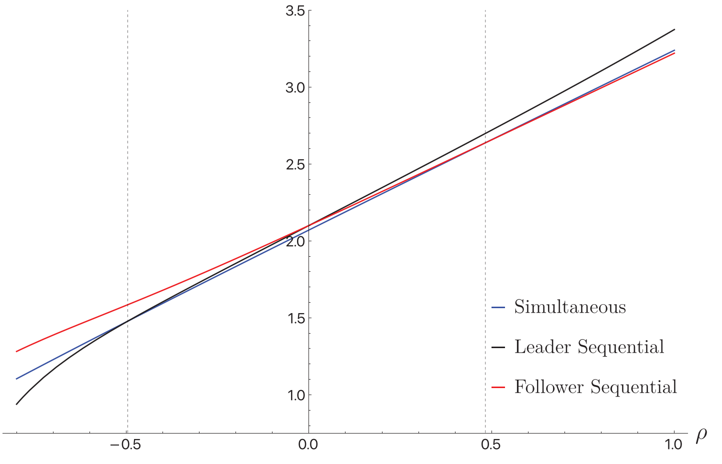

Figure 4. Leader's and follower's payoffs under sequential versus simultaneous moves. Between the dashed vertical lines, both players prefer sequential moves. Parameters: $\mu = \phi = 1$, $\sigma = 0.2$. (Color figure can be viewed at wileyonlinelibrary.com)

region, being a leader ceases to be profitable: when trading simultaneously, the other activist's likely opposite position means access to liquidity at low prices, while being a follower would pay off because the leader bearing more activism costs offsets the loss from the market maker being better informed.

The previous coordination result, which states a preference for sequential trading, is important because the stronger competition that arises with simultaneous moves could a priori benefit the activists, if the firm's value is endogenous. To illustrate, consider the first part of the proposition stating that the traders scale back when another activist with market power is present (which we anticipated in Section II.B)—the slope $\sqrt{\sigma^2/2\phi}$ is smaller than in the single-player version $\alpha^K := \sqrt{\sigma^2/\phi}$. However, with enough symmetry, their combined order is still larger than the single-player benchmark; for instance, if $X_0^L = X_0^F > \mu$, then $2\sqrt{\frac{\sigma^2}{2\phi}}(X_0 - \mu) > \sqrt{\frac{\sigma^2}{\phi}}(X_0 - \mu)$, implying that the competition effect at play delivers a more pronounced impact on the firm's ex post value. The problem is that such an outcome need not be stable: to maximize profits, an activist may favor a lower firm value in exchange for lower acquisition and activism costs. This demonstrates the importance of examining how blockholders' *private* benefits and costs from interventions can affect governance, as Edmans and Holderness (2017) emphasize.

B. Other Factors Favoring Leader-Type Behavior

Block Size. Do larger blockholders benefit from acting as leaders? To shed light on this question, Figure 5 plots the expected payoff of a first (top curve) and second (lower curve) mover conditional on a block X_0^i (horizontal axis), net of the payoff of moving simultaneously with the counterparty; correlation

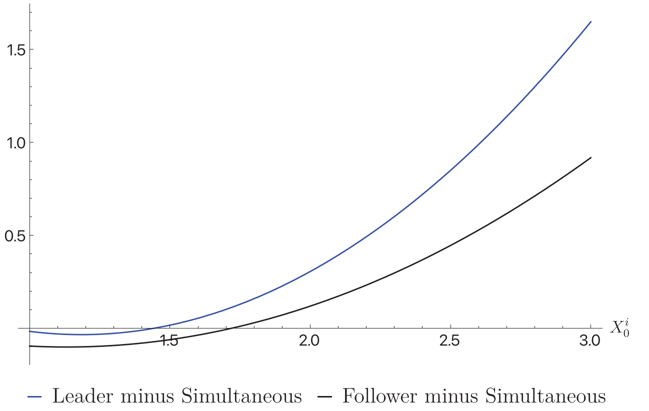

Figure 5. Expected payoff of $i = L, F$ conditional on X_0^i net of simultaneous-move counterpart. Parameter values: $\mu = \phi = 1$, and $(\rho, \sigma) = (0.5, 1)$. (Color figure can be viewed at wileyonlinelibrary.com)

is positive and blocks weakly above average ($\mu = 1$). As blocks grow past a threshold close to the mean, the net benefit of acting as a monopolist in any period is increasing in block size—and being a leader is always preferred to being a follower.

The key to this finding is how the competition effects just discussed play out as block size varies. Specifically, when correlation is positive, owning a larger block is a signal of the other activist also having a large block (recall Y_0^i, $i \in \{L, F\}$, from Lemma 1). In this case, acquisition costs are high when trading simultaneously, so there are increasing gains from trading in isolation as blocks grow. But this may not be the case for very small blockholders, such as those around μ in the figure. Indeed, since these activists do not change their positions much, and they do not expect much competition, acquisition costs are less relevant—the positive effect that competition has on firm value can dominate slightly for them.

Activist Productivity. Do more productive activists benefit from acting as leaders? Now consider an extreme asymmetric version of our baseline model: there is a productive activist with effort costs $\frac{1}{2\zeta}W^2$, where $\zeta > 0$ is a commonly known scalar, and a second activist who cannot affect the firm's value (e.g., $\zeta \searrow 0$ for this player). As the latter activist acts like the passive fund from Section II.B, we can use this example to uncover the extent to which the benefits associated with being able to manipulate beliefs are linked to the ability to affect fundamentals. To maximize the scope for the former channel, we assume perfect correlation.

PROPOSITION 6: *Suppose that $\rho = \phi$. For sufficiently small $\sigma > 0$, if the productive activist leads and the unproductive activist follows, their respective ex ante payoffs are higher than in the opposite configuration. If instead both block-*

holders are equally productive according to $\zeta > 0$, then leading is always better than following for $\sigma > 0$ small.

Despite not being able to manipulate an unproductive activist, the productive one always wants to go first due to her informational advantage being larger when leading. Interestingly, the unproductive blockholder becomes *worse off* when he leads—being able to manipulate traps him in an inferior outcome, at least when σ is small (and hence their trades are also small), which makes our analytical results simpler.

This means that being able to directly intervene in the firm can be key for monetizing market signals as a tool to influence others. Indeed, by the final part of the proposition, the first-mover advantage reappears when the productivity of the originally passive activist is restored. The difference lies in the value of holdings for this player when he leads, which takes the value $\zeta(X_T^L + X_T^F)X_T^L$ if productive but only $\zeta X_F^L X_T^L$ if unproductive. In the first case, being able to add value in line with the block limits the extent of the manipulation—because the forgone trading gains are larger—in a way that is not detrimental to overall profits. See Section IV in the Internet Appendix for the proof of the previous result.

Multiple Followers. Let us quickly explore the effect of varying the number of followers. Our original follower is split among N individuals: each has an identical initial block $X_0^F \sim \mathcal{N}(\mu/N, \phi/N^2)$, with $\text{cov}(X_0^L, X_0^F) = \rho/N$. As this specification holds fixed the total amount of (i) follower-associated uncertainty and (ii) follower effort absent any trading, any change in outcomes must come from a change in the strategic behavior of the followers. The firm's value continues to be the sum of all activists' terminal positions.

Motivated by the notion of similarity attributed to "wolf pack activism," which we discuss shortly, we set $\rho > 0$. We use $M_1^F := \mathbb{E}[X_0^F|\mathcal{F}_1]$ and $\gamma_1^F := \mathbb{E}[(X_0^F - M_1^F)^2|\mathcal{F}_1]$ for the market maker's posterior about each individual follower's position given Ψ_1. The proof of the next result can also be found in Section IV in the Internet Appendix.

PROPOSITION 7: *Fix $\rho \in (0, \phi]$. In the unique PBS equilibrium, each follower trades via $\theta^F = \alpha_F(X_0^F - M_1^F)$, where $\alpha_F = \sqrt{\frac{\sigma^2}{N\gamma_1^F}}$. Also, α_F is increasing in N, both α_L and the firm's ex ante value decrease in N, and the leader's ex ante payoff grows $\sim \sqrt{N}$ for N large. If $\rho = \phi$, the leader's gain from moving first also grows $\sim \sqrt{N}$ for N large.*

That α_F increases with N reflects stronger competitive effects: as each follower possesses a smaller fraction of the total existing private information, captured by $\gamma_1^F \propto 1/N^2$, the individual contribution to price impact falls and trading more aggressively is optimal.[34] The value of manipulation then grows, causing both α_L and the firm's ex ante value to decrease with N. In turn, the leader's ex ante payoff grows at a rate of $\sqrt{N}$ for N large, due to the interaction term $\mathbb{E}[X_T^L N X_T^F]$: the followers' more aggressive trading leads to terminal

[34] See Edmans and Manso (2011) and Kyle (1989) for results relying on an identical logic.

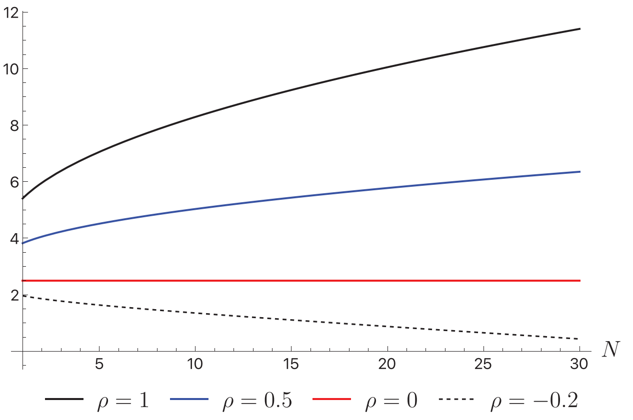

Figure 6. Leader's expected payoff as a function of the number of followers, for various levels of covariance. Other parameter values: $\phi = \mu = \sigma = 1$. (Color figure can be viewed at wileyonlinelibrary.com)

positions that covary more strongly with that of the leader. Two additional points are in order. First, if correlation is perfect, we can show analytically that the leader's expected payoff net of the simultaneous-move benchmark has the same growth rate (last part of the proposition). Second, related to the covariance effect, Figure 6 shows that N and ρ are complements: as ρ grows, the leader benefits more from having additional followers because their increased trading intensity is more in line with that of the leader. This benefit is likely less important when initial blocks are negatively correlated due to the risk of efforts becoming misaligned.

C. Wolf Packs

Our model builds on the following hypotheses.

HYPOTHESIS 1: (Sensitivity to mispricing) The activists have a strong tendency toward monetizing prevailing trading gains, accumulating more shares as they become more underpriced.

HYPOTHESIS 2: (Noncooperative behavior) The activists do not employ formal agreements; rather, they maximize their own profits, understanding their counterparties' incentives and how trading and the price mechanism can be used to their own advantage.

HYPOTHESIS 3: (Similarity) The activists hold similar stakes in a statistical sense, in that blocks are not too negatively correlated—this favors the emergence of a leader. For intermediate levels of interdependence, coordinating the timing of trades is mutually beneficial.

HYPOTHESIS 4: (Moderate stakes) Since in practice there is a fixed number of shares, similarity (in the above sense) requires the activists to have small to moderate stakes. Otherwise, the possibility of sequential trades is undermined from the market maker's perspective.

HYPOTHESIS 5: (Multiple small followers) If there is enough similarity (i.e., $\rho > 0$), competition effects associated with the presence of multiple followers make it increasingly profitable for a hypothetical leader to emerge; this effect is reinforced if a leader has a larger block.

Natural candidates to satisfy Hypotheses 1 to 5 are hedge funds, in particular, the so-called *wolf-pack activism* phenomenon, whereby multiple hedge funds of small to moderate size attack a firm in parallel—and in a seemingly noncooperative manner—after a leader fund has built a stake in the target.[35] Starting with Hypothesis 1, these funds, the quintessential example of exploitation of mispricing opportunities, have followed a "value investor" approach to activism by targeting firms underpriced relative to their potential, as measured by a large book-to-market value ratio or a low Tobin's q (Brav et al., 2008; Brav, Jiang, and Li, 2022). In our model, the intensive margin of intervention increases (through more aggressive block-building) as the firm is more underpriced.

Regarding Hypothesis 2, there are substantial costs associated with being perceived as a "group" in the United States.[36] The key issue is that an organized set of activists is treated as a single entity with a block equal to the sum of its components. In this context, there are potential legal fees if the target firm alleges a violation of disclosure requirements (e.g., not disclosing when the aggregate block surpasses 5%), fees that would be absent if the activists were individually below the 5% threshold and acted noncooperatively. At the same time, however, complying with disclosure rules means that a group necessarily invites undesired competition *before* achieving the desired block size, thereby making block acquisition more costly. In addition, the target firm may bar the acquisition of more shares by the group members—the identities of which are revealed upon disclosure—which may preclude the success of any engagement.[37]

With explicit agreements being risky (and indeed rarely seen, as Becht et al. (2017) argue), activists can rely on their common understanding of the environment to act in parallel. In the United States, two factors have increased the role of *strategic considerations* in recent decades. First, ownership has become more concentrated. Second, changes in the Securities and Exchange Commission (SEC) regulation allow activists to communicate in a limited

[35] See Becht et al. (2017), Brav, Dasgupta, and Mathews (2022), Briggs (2007), and Coffee and Palia (2016).

[36] Section 13(d)(3) of the Securities Exchange Act. See, for instance, Coffee and Palia (2016), pp. 24–26 for an expanded discussion on this topic.

[37] Similar restrictions apply in other jurisdictions. Under European law for instance, activists "acting in concert" would be treated as one under the Transparency Directive (crossing a given shareholder ownership threshold) and under the Acquisitions Directive (crossing a given shareholder ownership threshold in financial firms after a proposed acquisition). See Ghetti (2014) for more discussion on the European case.

manner without this being characterized as insider trading or trading as a group, or without triggering costly filing requirements.[38] The result is that fewer relevant players are present, each with the power to influence market outcomes, and with communication channels that favor the development of more tacit agreements—one possibility being to immediately attack after others do, with common knowledge of such action triggering leader behavior in the way that we propose.

Regarding similarity (Hypothesis 3), hedge funds' niche business strategies strongly suggest block similarity in a statistical sense. This is in line with findings on strategic investors by Hadlock and Schwartz-Ziv (2019), who argue that positive interdependence is indeed indicative of similar investment styles. Similar trading strategies also translate into similar research, and hence into an overlap in potential targets that reinforces block interdependence. And as we argue, hedge funds' stakes are relatively small (Hypothesis 4), consistent with a goal of influencing firms but not exerting control (e.g., Brav, Jiang, and Li, 2022), but this blockholder category is argued to be the only one with a proven record of significantly affecting firms (Brav et al., 2008).

While obtaining direct evidence on wolf packs is difficult due to their inherently secretive nature, Wong (2020) provides indirect evidence of potential wolf pack orchestration by a leader. Regarding competition effects (Hypothesis 5), he shows that on the trigger date of campaigns featuring a single 13D filer, trades by this hypothetical leader explain only 25% of the observed turnover, with the unexplained component averaging 240% of that in normal times. He further shows that investors who have a prior relationship with the leader from past campaigns are more likely to buy shares. We note that leaders in such attacks must necessarily have bigger blocks, simply because no other follower discloses.

The SEC's recent guidance on shareholder communication in the context of "tipping" argues that when a blockholder that has to make a disclosure communicates this nonpublic information to other investors so that they can purchase shares, and these purchases happen, the parties involved could be classified as a group.[39] As such, the importance of market signals for activists in the way that we propose is likely to grow, so long as activists have superior ability to filter information about each other's actions as we describe in Section II.B. In this line, Chabakauri, Fos, and Jiang (2025) provide evidence that such ability to read market signals is indeed present among blockholders, in the case of corporate insiders detecting activists' trades from order flows: during activism events, these investors engage in abnormal purchases following activists' trades before interventions go public. As the authors argue,

[38] Lewellen and Lewellen (2025) note that Rule 14a–2(b)(2) of the Securities Exchange Act permits shareholder communication regarding voting intentions (and reasons) at minimal cost as long as proxies are not solicited or votes coordinated. The authors also show that to reach 25% of shares, around five shareholders need to be contacted on average, while the 50% threshold requires around 27 institutions.

[39] See pp. 130–139 in U.S. Securities and Exchange Commission (2023a).

such blockholders are unlikely tippees, because they have strong incentives to counter activists and defend their private benefits from control.

V. Other Equilibria and Refinement

Equilibria in which at least one of our activists attaches a negative weight to the initial block can arise due to a *coordination motive* in value creation or destruction. Suppose that the activists start "long" on the firm (i.e., $X_0^L, X_0^F > 0$) and that the leader expects the follower to switch to a negative position. In the expectation of negative effort by the follower, the leader may then want to build a negative stake too, as a positive surplus would emerge if both players exert negative effort—and similarly for the follower.

Negative weights on initial blocks operationalize this logic, which we formalize through two results in our Internet Appendix (Section V.A). First, we show that given $\rho > 0$, if $\sigma > 0$ is sufficiently large, then there is an equilibrium in which both α_L and α_F take negative values: since $\rho > 0$ implies that the activists' initial blocks likely have the same sign, this is consistent with a motive to "meet on the same side." In fact, a larger order flow volatility σ facilitates such coordination because, by reducing price impact, it can induce the follower to trade so aggressively that a *position reversal happens*. Indeed, we can show that the follower's equilibrium coefficients must always satisfy $\alpha_F = \pm\sqrt{\sigma^2/\gamma_1^F}$, so in the negative root case, $\alpha_F < -\sqrt{\sigma^2/\phi}$ implies that α_F can be arbitrarily negative as σ grows. In turn, this means that sufficiently many follower (initial block) types can be expected to be reversed, and the coordination mechanism described can be self-fulfilling.[40]

Order flow volatility also relates to the lower bound $\underline{\rho} < 0$ in Theorem 1, which helps explain our second coordination result, now for negative ρ. The key is the "effective cost of trading" mentioned in the SOCs of Section II.A: with positive correlation, more aggressive trades are more costly than if fundamentals were exogenous because they reduce the follower's effort, while with negative correlation, such trades now add value via the latter channel, which goes against price impact.[41] As the leader's problem gains concavity when $\rho > 0$, a PBS equilibrium always exists in that region. But this concavity weakens when $\rho < 0$, to the point that PBS equilibria will cease to exist if ρ becomes sufficiently negative for fixed σ: the leader's SOC (15) cannot be satisfied by positive (α_L, α_F) pairs, explaining $\underline{\rho} < 0$ in our theorem. Our second coordination result is a proof of concept of this logic: if $\rho = -\phi$, there is no equilibrium in which α_F and α_L have the same sign, but one with $\text{sign}(\alpha_L) \neq \text{sign}(\alpha_F)$ exists for all $\sigma > 0$, again consistent with the coordination logic given the negative correlation at the start.

Lower-order flow volatility can thus play a dual role: by making manipulation easier, it can make deviations from candidate coordination equilibria more

[40] Our result also shows that in the leader's strategy, $\alpha_L < -\sqrt{\sigma^2/\phi}$.

[41] To see this tension, refer to the numerator in the second ratio of (7) for period-1 price impact Λ_1.

profitable when $\rho > 0$; and by increasing price impact, it can restore concavity in the leader's problem when $\rho < 0$. Thus, market illiquidity can refine the PBS equilibrium within the linear class. We prove the following in Section V.B of the Internet Appendix.

PROPOSITION 8: *Suppose that $\rho \in (-\phi, \phi)$. Then for sufficiently small but positive σ, a PBS equilibrium exists and is the unique equilibrium within the linear class.*

Coordination equilibria are not unreasonable because they rely on negative fundamentals, as our model and many others in the literature allow. Indeed, it is well-known that acquiring a negative position can be profitable if it triggers a mechanism that simply lowers a firm's value (Goldstein and Guembel, 2008). When it comes to positive activism, however, it is the feature of revising one's initial choices so radically simply due to the expectation of what others will do that seems stark: such an unwinding before activism occurs means going against the information acquisition and research that in practice leads to the choice of an initial block. Brav, Jiang, and Li (2022) provide evidence that undermines this possibility: hedge funds' average duration of investment in a target is over 530 days, meaning that more than a year and a half passes between disclosure of a position and a major divestiture.

VI. Conclusion

In this paper, we develop a theory of influence among blockholders that puts cost-management motives at the forefront of the analysis: trading in sequence to control acquisition costs, and then using market signals to influence others to bear intervention costs. Through our analysis, we provide new insights regarding blockholders as informed traders vis-à-vis traditional insider traders, show how externalities that activists impose on others via trading can shape corporate governance, and derive measures of price abnormality that permit new interpretations of the empirical evidence on the topic. Taken together, the model that we propose, along with its variations, constitutes a fresh approach to a highly understudied topic—how activist investors may coordinate their actions in noncooperative ways.

Above we highlight several lines of inquiry that future empirical work could explore based on our results. On the theoretical front, there are three clear directions. The first is to develop a multiplayer, fully dynamic, repeated trade version of Proposition 2. For example, one could start from the uncorrelated case to shed light on time-horizon effects: on the one hand, the usual insider "splitting trades" logic would imply that trades should be small away from the end-game, but that is when beliefs are most responsive, which would favor the dampening of trades. The second is to examine cost structures beyond the quadratic case: while we argue that our findings are driven mainly by effort being increasing in terminal positions (the linear case being the simplest), building on the innovative work by Back et al. (2018) could provide a more informed view regarding the interplay between market liquidity and the distortion of trades that we uncover.

Finally, while we examine factors supporting both block accumulation and first-mover advantages, developing a theory that endogenizes the emergence of leaders and followers—and their blocks—is key. While this is ultimately a matter of observed signals, constructing a general theoretical model seems challenging. In Section VI of our Internet Appendix, we choose a middle ground by endogenizing the activists' initial positions while keeping their identities exogenous but possibly random. Our generalization adds an exogenous component of firm value (as in Proposition 1(i)) and a preround of trading based on private signals, just as in traditional microstructure models. By varying the degree of correlation of the latter signals and allowing for some interim information revelation about firm value, we generate early trades—and hence "initial" blocks—that exhibit both types of interdependence.

This early round can be used by prospective leaders to ease the tension between exploiting trading gains and manipulating others that arises when finalizing a block. More specifically, as one activist becomes increasingly likely to be the leader, she trades less aggressively on her private signal in the preround—because doing so results in a smaller initial block, this type of behavior reduces the trading gains to be given up when this trader becomes a leader and seeks to influence others, all else equal. At the same time, a smaller footprint also means a smaller informational advantage, and hence encodes less price impact. The likely leader can then build a block more aggressively in the first period of the leader-follower subgame. Taken together, through this initial block optimization, greater anticipation of monopoly and manipulation power leads to block-accumulation dynamics featuring purchases that are slow early on but later accelerate to better exploit trading gains without discouraging others from adding value.

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Appendix

A. Proof of Lemma 1

We make repeated use of the traditional projection theorem for Gaussian random variables. Specifically, if (X, Y) are jointly Gaussian, then $X|Y$ is also Gaussian with $\mathbb{E}[X|Y] = \mathbb{E}[X] + \frac{\mathrm{cov}[X,Y]}{\mathrm{var}[Y]}(Y - \mathbb{E}[Y])$ and $\mathrm{var}[X|Y] = \mathrm{var}[X] - \frac{\mathrm{cov}^2[X,Y]}{\mathrm{var}[Y]}$.

Prior to trading, players use their own positions to update beliefs about the other player's position. Applying the projection theorem to the pair (X_0^i, X_0^{-i}) yields Y_0^i and ν_0^i as stated in the lemma. Using the conjectured linear strategies in (4), P_0 satisfies

$$P_0 = \mathbb{E}[(1+\alpha_L)X_0^L + \delta_L\mu + (1+\alpha_F)X_0^F + \beta_F P_1 + \delta_F\mu]. \tag{A1}$$

Using $\mathbb{E}[P_1] = P_0$ to eliminate P_1 yields an equation for P_0 with solution (5), where the denominator will be nonzero due to the leader's second-order condition (SOC) (15).

In period 1, after observing Ψ_1 the market maker updates beliefs about X_0^L and X_0^F assuming $\Psi_1 = \alpha_L X_0^L + \delta_L\mu + \sigma Z_1$. By the projection theorem,

$$\begin{pmatrix} X_0^L \\ X_0^F \end{pmatrix} \sim N\left(\begin{pmatrix} M_1^L \\ M_1^F \end{pmatrix}, \begin{pmatrix} \gamma_1^L & \rho_1 \\ \rho_1 & \gamma_1^F \end{pmatrix}\right),$$

where

$$M_1^L := \mathbb{E}[X_0^L|\mathcal{F}_1] = \mu + \frac{\alpha_L\phi}{\alpha_L^2\phi + \sigma^2}\{\Psi_1 - \mu(\alpha_L + \delta_L)\}, \tag{A2}$$

$$M_1^F := \mathbb{E}[X_0^F|\mathcal{F}_1] = \mu + \frac{\alpha_L\rho}{\alpha_L^2\phi + \sigma^2}\{\Psi_1 - \mu(\alpha_L + \delta_L)\}, \tag{A3}$$

$$\gamma_1^L = \frac{\phi\sigma^2}{\alpha_L^2\phi + \sigma^2}, \qquad \gamma_1^F = \frac{\alpha_L^2[\phi^2 - \rho^2] + \phi\sigma^2}{\alpha_L^2\phi + \sigma^2}, \qquad \rho_1 = \frac{\rho\sigma^2}{\alpha_L^2\phi + \sigma^2}. \tag{A4}$$

The market maker forecasts terminal positions based on the conjectured strategies:

$$\tilde{M}_1^L := \mathbb{E}[X_T^L|\mathcal{F}_1] = (1+\alpha_L)M_1^L + \delta_L\mu$$
$$\text{and} \quad \mathbb{E}[X_T^F|\mathcal{F}_1] = (1+\alpha_F)M_1^F + \beta_F P_1 + \delta_F\mu.$$

We use $\tilde{\rho}_1 := (1+\alpha_L)\rho_1$ to denote the market maker's posterior covariance of X_T^L and X_0^F (the current positions at the end of the first period). Using the previous expressions, it is easy to see that the first-period price P_1 given by (6) and (7) is obtained by solving for P_1 in the equation $P_1 = \mathbb{E}[X_T^L + X_T^F|\mathcal{F}_1]$. Likewise, it is easy to check that the follower's updated mean belief Y_1^F about X_T^L after observing Ψ_1 given in (8) is obtained by first using the projection theorem to form an updated belief about X_0^L (from his prior Y_0^F) assuming $\Psi_1 = \alpha_L X_0^L + \delta_L\mu + \sigma Z_1$, and then forecasting the terminal position based on the conjectured strategy for the leader.

In period 2, given Ψ_2, the market maker's updated mean beliefs about (X_T^L, X_T^F) follow from the projection theorem and conjectured strategies, that is, assuming $\Psi_2 = \alpha_F X_0^F + \beta_F P_1 + \delta_F\mu + \sigma Z_2$:

$$\begin{aligned} M_T^F &:= \mathbb{E}[X_T^F|\mathcal{F}_2] \\ &= (1+\alpha_F)M_1^F + \beta_F P_1 + \delta_F\mu + \frac{\alpha_F\gamma_1^F(1+\alpha_F)}{\alpha_F^2\gamma_1^F + \sigma^2}[\Psi_2 - \alpha_F M_1^F - \beta_F P_1 - \delta_F\mu], \end{aligned} \tag{A5}$$

$$M_T^L := \mathbb{E}[X_T^L|\mathcal{F}_2] = \tilde{M}_1^L + \frac{\alpha_F\tilde{\rho}_1}{\alpha_F^2\gamma_1^F + \sigma^2}[\Psi_2 - \alpha_F M_1^F - \beta_F P_1 - \delta_F\mu]. \tag{A6}$$

The second period price is then simply $P_2 = M_T^L + M_T^F$, which produces (9) to (10).

B. Preliminaries for Equilibrium Construction

In this section, we state and prove a proposition used in proving our main results that characterizes equilibria via a system of equations and inequality conditions derived from the players' FOCs and SOCs and the pricing equations. The first half of the proposition below provides necessary conditions for equilibrium. The second half of the proposition is a strong converse—it shows that we can focus on the system of equations for the signaling coefficients (α_F, α_L). These coefficients determine price impact and therefore pin down the remaining coefficients.

PROPOSITION A1: *The tuple* $(\alpha_F, \beta_F, \delta_F, \alpha_L, \delta_L)$ *with a pricing rule defined by (6) and (7) as well as (9) and (10) characterize an equilibrium only if* $\Lambda_1 \neq 0$, $\Lambda_2 > \frac{1}{2}$, $\beta_F \neq 1$, $\phi(1+\alpha_L)+\rho \neq 0$, *and*

$$\alpha_F^2 = \sigma^2/\gamma_1^F, \tag{A7}$$

$$\beta_F = -\frac{\rho}{\phi(1+\alpha_L)+\rho}\alpha_F, \tag{A8}$$

$$\delta_F = \frac{(\alpha_L+\delta_L)\rho - \alpha_L\phi - (\phi-\rho)}{\phi(1+\alpha_L)+\rho}\alpha_F, \tag{A9}$$

$$\alpha_L = \frac{\sigma^2}{\phi\alpha_L} - \frac{\rho\alpha_F}{\phi(1+\alpha_L)+\rho(1+\alpha_F)}, \tag{A10}$$

$$\delta_L = -\frac{\sigma^2}{\phi\alpha_L}, \tag{A11}$$

$$0 \geq \sigma^2 - \alpha_L^2\phi - 2\alpha_L[\rho(1+\alpha_F)+\phi], \tag{A12}$$

$$0 \geq -\alpha_F[\sigma^2(\phi+\rho(1+\alpha_L)) + \alpha_L^2(\phi^2-\rho^2)]. \tag{A13}$$

Furthermore, if $\rho \neq 0$, *one of the following conditions must hold:*

$$\alpha_F = \alpha_{F,1}(\alpha_L) := \sqrt{\frac{\sigma^4+\alpha_L^2\sigma^2\phi}{\sigma^2\phi+\alpha_L^2(\phi^2-\rho^2)}} = \frac{(\rho+\phi+\phi\alpha_L)(\alpha_L^2\phi-\sigma^2)}{\rho[\sigma^2-\alpha_L(1+\alpha_L)\phi]} \quad \text{or} \tag{A14}$$

$$\alpha_F = \alpha_{F,2}(\alpha_L) := -\sqrt{\frac{\sigma^4+\alpha_L^2\sigma^2\phi}{\sigma^2\phi+\alpha_L^2(\phi^2-\rho^2)}} = \frac{(\rho+\phi+\phi\alpha_L)(\alpha_L^2\phi-\sigma^2)}{\rho[\sigma^2-\alpha_L(1+\alpha_L)\phi]}. \tag{A15}$$

Conversely, suppose (α_F, α_L) *satisfy (A12) and (A13), either (A14) or (A15), and* $\phi(1+\alpha_L)+\rho \neq 0$. *Then (i)* $(\beta_F, \delta_F, \delta_L)$ *are well-defined via (A8), (A9), and (A11), with* $\beta_F \neq 1$, *(ii)* $\Lambda_1 \neq 0$ *and* $\Lambda_2 \neq 0$ *are well-defined via (7) and (10), and (iii) the associated strategies and pricing rule constitute an equilibrium.*

PROOF: We first establish necessity. It is immediate from the leader's SOC (15) that $\Lambda_1 \neq 0$ and $\beta_F \neq 1$. Likewise, (14) implies $\Lambda_2 > \frac{1}{2}$, and in particular, $\Lambda_2 \neq 0$. We next analyze the follower's conditions. The follower's FOC expands as

$$0 = -\mathbb{E}_F[P_1 + \Lambda_2\{\Psi_2 - \mathbb{E}[\Psi_2|\mathcal{F}_1]\}] - \Lambda_2\theta^F + (X_0^F + \theta^F) + Y_1^F \tag{A16}$$

$$= -P_1 - \Lambda_2(\theta^F - [\alpha_F M_1^F + \beta_F P_1 + \delta_F \mu]) - \Lambda_2\theta^F + (X_0^F + \theta^F) + Y_1^F, \tag{A17}$$

which we impose at the candidate strategy in (4). Since $\Lambda_1 \neq 0$, we can invert (6) to write $\Psi_1 = \mu(\alpha_L + \delta_L) + \frac{P_1 - P_0}{\Lambda_1}$, with P_0 given by (5), which we can then use to eliminate Ψ_1 in M_1^F and Y_1^F (see (A3) and (8)). Recall that Y_0^F (appearing in Y_1^F) is a linear combination of (X_0^F, μ). The resulting equation is thus linear in (X_0^F, P_1, μ), and it must be identically zero over $(X_0^F, P_1, \mu) \in \mathbb{R}^3$. Hence, the coefficients on each variable (X_0^F, P_1, μ) must be zero, delivering three equations. The first, from the coefficient on X_0^F, is

$$0 = -2\Lambda_2\alpha_F + (1+\alpha_F) + \frac{\partial Y_1^F}{\partial X_0^F} = \frac{\tilde{\Lambda}_2}{\gamma_1^F}(\sigma^2 - \alpha_F^2\gamma_1^F), \tag{A18}$$

where $\tilde{\Lambda}_2 := \frac{\gamma_1^F}{\alpha_F^2\gamma_1^F + \sigma^2} \times [1 + \alpha_F + \rho_1/\gamma_1^F]$. The second, from the coefficient on P_1, is

$$\begin{aligned} 0 &= -1 - \Lambda_2\left(-\alpha_F\frac{\partial M_1^F}{\partial P_1}\right) - \Lambda_2\beta_F + \beta_F + \frac{\partial Y_1^F}{\partial P_1} \\ &= -\frac{\tilde{\Lambda}_2}{\gamma_1^F}\left[\frac{\rho\sigma^2(1-\beta_F)}{\phi(1+\alpha_L)+\rho(1+\alpha_F)} + \beta_F\alpha_F\gamma_1^F\right]. \end{aligned} \tag{A19}$$

The third, from the coefficient on μ, is

$$\begin{aligned} 0 &= -\Lambda_2\left(-\alpha_F\frac{\partial M_1^F}{\partial \mu}\right) - \Lambda_2\delta_F + \delta_F + \frac{\partial Y_1^F}{\partial \mu} \\ &= \frac{\tilde{\Lambda}_2}{\gamma_1^F}\left[-\sigma^2 + \frac{(2+\alpha_F+\alpha_L+\delta_F+\delta_L)\rho\sigma^2}{\phi(1+\alpha_L)+\rho(1+\alpha_F)} - \alpha_F\delta_F\gamma_1^F\right], \end{aligned} \tag{A20}$$

where the μ terms of M_1^F and Y_1^F incorporate the elimination of Ψ_1 described above.

We argue that in any linear equilibrium, the right-hand sides of (A18) to (A20) are well-defined and $\tilde{\Lambda}_2 \neq 0$. First, $\gamma_1^F > 0$ for any (finite) α_F. Second, since $\Lambda_2 \neq 0$, $\tilde{\Lambda}_2$ is well-defined and nonzero. Third, $\Lambda_1 \neq 0$ implies $\phi(1+\alpha_L)+\rho(1+\alpha_F) \neq 0$ in the denominators in (A19) and (A20).

We can now derive (A7) to (A9) and (A13). Since $\tilde{\Lambda}_2 \neq 0$ is necessary for equilibrium, (A18) reduces to (A7). (Note that this implies $\alpha_F \neq 0$.) Using this fact to write $\alpha_F \gamma_1^F = \sigma^2/\alpha_F$, (A19) reduces to

$$0 = -\frac{\tilde{\Lambda}_2}{\gamma_1^F}\left[\frac{\rho\sigma^2(1-\beta_F)}{\phi(1+\alpha_L)+\rho(1+\alpha_F)} + \beta_F\frac{\sigma^2}{\alpha_F}\right]$$
$$= -\frac{\tilde{\Lambda}_2\sigma^2}{\gamma_1^F\alpha_F[\phi(1+\alpha_L)+\rho(1+\alpha_F)]}\big[\rho\alpha_F + \beta_F(\phi[1+\alpha_L]+\rho)\big]. \tag{A21}$$

We claim that $\phi(1+\alpha_L)+\rho \neq 0$ in equilibrium. By way of contradiction, if $\phi(1+\alpha_L)+\rho = 0$, then (A21) implies $\alpha_F = 0$ or $\rho = 0$. Equation (A7) rules out $\alpha_F = 0$. And if $\rho = 0$, we have $\alpha_L = -1$, and thus $\Lambda_1 = 0$, violating the leader's SOC. Hence, $\phi(1+\alpha_L)+\rho \neq 0$, and (A21) reduces to (A8). Analogous arguments yield (A9) from (A20). Lastly, using (A7) to eliminate α_F^2 terms, the follower's SOC (14) reduces to (A13).

We next derive the leader's identities (A10) and (A11) and condition (A12). For the leader, the following FOC, evaluated at the conjectured strategy, must hold for all $(X_0^L, \mu) \in \mathbb{R}^2$:

$$0 = -\mathbb{E}_L[P_0 + \Lambda_1\{\Psi_1 - \mathbb{E}[\Psi_1]\}] - \theta\Lambda_1 + (X_0^L + \theta^L) + \mathbb{E}_L[X_T^F]$$
$$+ (X_0^L + \theta^L)\frac{\partial \mathbb{E}_L[X_T^F]}{\partial \theta^L}. \tag{A22}$$

Setting the coefficients on these variables to zero and using (A7) and (A8), it is straightforward to show that (A22) reduces to (A10) and (A11), where $\alpha_L \neq 0$ in equilibrium since the leader's SOC implies $\Lambda_1 \neq 0$. The leader's SOC is equivalent to (A12).

To obtain (A14) or (A15), first note that the positive and negative values of α_F solving (A7) are $\pm\sqrt{\frac{\sigma^4+\alpha_L^2\sigma^2\phi}{\sigma^2\phi+\alpha_L^2(\phi^2-\rho^2)}}$. Next, solve for α_F in (A10) by multiplying through by the denominators on the right-hand side and rearrange terms to obtain

$$\alpha_F\rho[\sigma^2 - \alpha_L(1+\alpha_L)\phi] = [\phi(1+\alpha_L)+\rho](\alpha_L^2\phi - \sigma^2). \tag{A23}$$

We claim that $\sigma^2 - \alpha_L(1+\alpha_L)\phi \neq 0$ in any solution to (A23). Indeed, since $\phi(1+\alpha_L)+\rho \neq 0$, $\sigma^2 - \alpha_L(1+\alpha_L)\phi = 0$ would imply $\alpha_L^2\phi - \sigma^2 = 0$, but these two equations cannot hold simultaneously. Thus, if $\rho \neq 0$, (A23) implies

$$\alpha_F = \frac{(\rho+\phi+\phi\alpha_L)(\alpha_L^2\phi - \sigma^2)}{\rho[\sigma^2 - \alpha_L(1+\alpha_L)\phi]}.$$

Since the solutions to (A7) are $\alpha_F = \alpha_{F,1}$ and $\alpha_F = \alpha_{F,2}$, we obtain (A14) and (A15).

For the sufficiency half of the proposition, take (α_F, α_L) as in the statement. Clearly, either $\alpha_F = \alpha_{F,1}$ or $\alpha_F = \alpha_{F,2}$ implies (A7). Now given $\phi(1+\alpha_L)+\rho \neq 0$, we can multiply (A14) or (A15) through by $\rho[\sigma^2 - \alpha_L(1+\alpha_L)\phi]$ to recover (A23). To recover (A10) from (A23), note that (A12) can be rewritten as $\sigma^2 + \alpha_L^2\phi - 2\alpha_L[\rho(1+\alpha_F)+\phi(1+\alpha_L)] \leq 0$, which implies $\alpha_L \neq 0$ and $\phi(1+\alpha_L)+\rho(1+\alpha_F) \neq 0$. Thus, the steps used to obtain (A23) from (A10) can be reversed, and δ_L is well-defined by (A11). Given that $\phi(1+\alpha_L)+\rho \neq 0$ by supposition, (β_F, δ_F) are well-defined by (A8) and (A9). Furthermore, $\phi(1+\alpha_L)+\rho(1+\alpha_F) \neq 0$ implies that $1 \neq -\frac{\rho\alpha_F}{\phi(1+\alpha_L)+\rho} = \beta_F$. This establishes (i). Hence, Λ_1 and Λ_2 are well-defined by (7) and (10), respectively. Moreover, by construction, (A12) and (A13) imply (15) and (14), so $\Lambda_1 \neq 0$ and $\Lambda_2 \neq 0$, establishing (ii).

For part (iii) of the sufficiency claim, note that since the players' best response problems are quadratic, it suffices to check the FOCs and SOCs. Given that the inequalities $\Lambda_1 \neq 0$, $\Lambda_2 \neq 0$, $\beta_F \neq 1$, $\phi(1+\alpha_L)+\rho \neq 0$ are satisfied, equations (A7) to (A11) imply the FOCs (A16) and (A22) by construction, and as noted for part (ii), the SOCs (15) and (14) are satisfied. □

C. Gap Form of Follower's Strategy

The following result formalizes the claim made about the follower's strategy in footnote [21], which we use to confirm that the follower's trade is unpredictable as anticipated in the theorem.

LEMMA A1: *In any linear equilibrium (PBS or otherwise),* $\theta^F = \alpha_F(X_0^F - M_1^F)$ *for* $\alpha_F = \pm\sqrt{\frac{\sigma^2}{\gamma_1^F}}$. *Hence, in a PBS equilibrium,* $\theta^F = \sqrt{\frac{\sigma^2}{\gamma_1^F}}(X_0^F - M_1^F)$.

PROOF: By Proposition A1, α_F must satisfy (A7), so either $\alpha_F = \alpha_{F,1} := \sqrt{\frac{\sigma^2}{\gamma_1^F}}$ or $\alpha_F = \alpha_{F,2} := -\sqrt{\frac{\sigma^2}{\gamma_1^F}}$. Moreover, by definition, in a PBS equilibrium, $\alpha_F > 0$ and thus $\alpha_F = \alpha_{F,1}$. Note that by the same proposition, (β_F, δ_F) are characterized by (A8) and (A9).

Now express M_1^F in terms of P_1 and μ by using (6) to replace the surprise term $\Psi_1 - \mu(\alpha_L + \delta_L)$ in (A3):

$$M_1^F = \mu + \frac{\alpha_L\rho}{\alpha_L^2\phi + \sigma^2}\frac{P_1 - P_0}{\Lambda_1}, \tag{A24}$$

where P_0 is linear in μ (see (5)). Substituting (A24) into $\theta^F = \alpha_{F,i}(X_0^F - M_1^F)$, $i \in \{1, 2\}$, then yields an expression for the follower's strategy in which the coefficient on X_0^F is $\alpha_{F,i}$, and the coefficients on (P_1, μ) equal $(\beta_{F,i}, \delta_{F,i})$ when (A8) and (A9) hold. This confirms that the follower's strategy has the stated form. □

D. Proof of Theorem 1

We first prove the claims about the follower's strategy up to some inequalities involving the leader's strategy that we establish later in the proof. To prove that $\mathbb{E}[\theta^F|\mathcal{F}_1] = 0$, we simply use the fact that, by Lemma A1, $\theta^F = \alpha_F(X_0^F - M_1^F)$, where M_1^F is defined as $\mathbb{E}[X_0^F|\mathcal{F}_1]$, and we take expectations conditional on $\mathcal{F}_1$. Lemma A1 also establishes that in a PBS equilibrium, $\alpha_F = \sqrt{\sigma^2/\gamma_1^F}$. To sign β_F, recall that $\alpha_F, \alpha_L > 0$ and $|\rho| \leq \phi$, so $\text{sign}(\beta_F) = -\text{sign}(\rho)$ via (A8). Similarly, from (A9), $\text{sign}(\delta_F) = \text{sign}((\alpha_L + \delta_L)\rho - \alpha_L\phi - (\phi - \rho))$. Since $\alpha_L\phi > 0$ and $\phi \geq \rho$, the sign will be negative if $(\alpha_L + \delta_L)\rho \leq 0$, which we establish when characterizing the leader's equilibrium strategy. Turning to the inequality $\beta_F < 1$, this is immediate when $\rho \geq 0$, since this implies $\beta_F \leq 0$. For $\rho < 0$, note that by using (A8), (A10) can be written as $\alpha_L = \frac{\sigma^2}{\phi\alpha_L} + \frac{\beta_F}{1-\beta_F}$. Our characterization of the leader's strategy shows that $\alpha_L > \alpha^K$, and thus $\alpha_L > \frac{(\alpha^K)^2}{\alpha_L} = \frac{\sigma^2}{\phi\alpha_L}$. It follows that $\frac{\beta_F}{1-\beta_F} > 0$, and thus $\beta_F \in (0, 1)$.

The rest of the proof is divided into four parts as follows. First, we address $\rho = 0$, in which case the unique linear equilibrium can be characterized in closed form (Proposition A2). Second, we consider $\rho \in (0, \phi]$, for which we establish existence of a PBS equilibrium and uniqueness within the PBS class (Proposition A3). Third, we show that for all $|\rho| > 0$ sufficiently small (allowing for positive or negative ρ), there exists a unique equilibrium within the linear class and it is a PBS equilibrium (Proposition A4). For both positive and negative ρ we prove the inequalities stated in the proposition. Fourth, we show that a PBS equilibrium fails to exist if ρ is sufficiently low (Proposition A5), and we construct $\underline{\rho} \in (-\phi, 0)$ presented in the proposition and ρ_0 mentioned in footnote 21. Recall that $\alpha^K := \sqrt{\frac{\sigma^2}{\phi}}$.

PROPOSITION A2: *For $\rho = 0$, there is a unique linear equilibrium: for $i \in \{L, F\}$, trader i trades $\theta^i = \alpha^K(X_0^i - \mu)$ and $\mathbb{E}[\theta^L|\mathcal{F}_0] = 0$.*

PROOF: For $\rho = 0$, (A13) becomes $-\alpha_F[\sigma^2\phi + \alpha_L^2] \leq 0$. The only solution to (A7) satisfying this is $\alpha_F = \sqrt{\frac{\sigma^2}{\gamma_1^F}} = \alpha^K$ (as $\rho = 0$ implies $\gamma_1^F = \phi$). Equation (A10) then yields $\alpha_L = \pm\alpha^K$. Of these, only $\alpha_L = \alpha^K$ satisfies (A12). Given $(\alpha_F, \alpha_L) = (\alpha^K, \alpha^K)$, it follows that $(\beta_F, \delta_F, \delta_L) = (0, -\alpha^K, -\alpha^K)$ is the unique solution to (A8), (A9), and (A11). These strategies and the pricing rule in (6) and (9) satisfy the FOCs and SOCs, so they constitute an equilibrium. Moreover, $\mathbb{E}[\theta^L|\mathcal{F}_0] = \mathbb{E}[\alpha^K(X_0^L - \mu)|\mathcal{F}_0] = \alpha^K(\mu - \mu) = 0$. □

In the next two propositions, note that the ranking of α_L and $-\delta_L$ determines the sign of $\mathbb{E}[\theta^L|\mathcal{F}_0] = (\alpha_L + \delta_L)\mu$.

PROPOSITION A3: *If $\rho \in (0, \phi]$, there is a unique PBS equilibrium and $0 < \alpha_L < \alpha^K < -\delta_L$.*

PROOF: By Proposition A1, (A14) is a necessary condition for (α_F, α_L) to be part of PBS equilibrium. Let $L(\alpha_L)$ and $R(\alpha_L)$ denote the left and right sides of the last equality in (A14). Define $\hat{\alpha} := \frac{-\phi+\sqrt{\phi^2+4\sigma^2\phi}}{2\phi} > 0$ to be the positive root of the denominator of $R(\alpha_L)$. Note that $\alpha^K > \hat{\alpha}$.

We have that L is positive and strictly increasing in α_L for $\alpha_L \geq 0$. Meanwhile, R is continuous on $[0, \hat{\alpha}) \cup (\hat{\alpha}, +\infty)$ and satisfies $R(\hat{\alpha}-) = -\infty$, $R(\hat{\alpha}+) = +\infty$, and $R(\alpha^K) = 0$. Furthermore, for $\alpha_L \in [0, \hat{\alpha}) \cup (\hat{\alpha}, +\infty)$,

$$R'(\alpha_L) = -\phi \frac{(\alpha_L^2\phi - \sigma^2)^2 + (\rho + \phi)(\alpha_L^2 + \sigma^2) + 2\alpha_L^3\phi^2}{\rho[\sigma^2 - \alpha_L(1 + \alpha_L)\phi]^2},$$

which is unambiguously strictly negative when $\rho > 0$. Thus, R is strictly decreasing on $[0, \hat{\alpha})$ and on $(\hat{\alpha}, +\infty)$. These facts imply that there exists a solution to (A14) on $(\hat{\alpha}, \alpha^K)$, and this is the only solution on $(\hat{\alpha}, +\infty)$. Since L is increasing for $\alpha_L \geq 0$ with $L(0) > 0$, while R is decreasing on $[0, \hat{\alpha})$ with $R(0) = -(\rho + \phi)/\rho < 0 < L(0)$ (given $\rho > 0$), there is no solution on $[0, \hat{\alpha})$, so the solution just found is unique among $\alpha_L \geq 0$. By (A11), $\alpha_L < \alpha^K$ implies $\alpha^K < -\delta_L$ (and $\delta_L < 0$).

Given this unique candidate for PBS equilibrium, we now verify the SOCs. For the leader, note that since $\alpha_L, \alpha_F > 0$, (A12) is bounded above by $\sigma^2 - \alpha_L^2\phi - \alpha_L\phi$, which is negative since $\alpha_L > \hat{\alpha}$. For the follower, (A13) holds by inspection for $\rho > 0$ since $\alpha_L > 0$ and $\alpha_F > 0$. Finally, $\alpha_L > 0$ implies the condition $\phi(1 + \alpha_L) + \rho \neq 0$. Therefore, the sufficiency part of Proposition A1 applies. □

We next turn to $|\rho| > 0$ close to 0.

PROPOSITION A4: *If $|\rho| > 0$ is sufficiently small, there exists a unique linear equilibrium, and it is a PBS equilibrium. If $\rho > 0$, then $\alpha_L < \alpha^K < -\delta_L$, and if $\rho < 0$, then $\alpha_L > \alpha^K > -\delta_L > 0$.*

PROOF: Assume throughout that $\rho \neq 0$. Let us call any pair (α_L, α_F) satisfying (A14) or (A15) a *candidate signaling pair*. We construct two candidate signaling pairs (α_L^*, α_F^*) and $(\alpha_L^\flat, \alpha_F^\flat)$. We then show that for small $|\rho|$, there are no other candidate signaling pairs satisfying the leader's SOC, and of these two pairs, only (α_L^*, α_F^*) satisfies the follower's SOC. We then invoke the converse part of Proposition A1 to establish existence of a unique equilibrium based on (α_L^*, α_F^*).

We claim that if $\rho < 0$, there exists $\alpha_L^* \in (\alpha^K, \infty)$ solving (A14) and $\alpha_L^\flat \in (\hat{\alpha}, \alpha^K)$ solving (A15). Analogous arguments for the case $\rho > 0$ establish the existence of $\alpha_L^* \in (\hat{\alpha}, \alpha^K)$ and $\alpha_L^\flat \in (\alpha^K, \infty)$; we omit this case for brevity. In either case, we ultimately show that α_L^* is the unique equilibrium value of α_L for small $|\rho|$. As before, let $R(\alpha_L)$ denote the right-hand side common to (A14) and (A15). Note that R is continuous on $(\hat{\alpha}, \infty)$, and it has the properties $\lim_{\alpha_L \to +\infty} R(\alpha_L) = +\infty$, $\lim_{\alpha_L \downarrow \hat{\alpha}} R(\alpha_L) = -\infty$, and $R(\alpha^K) = 0$. The left-hand side of (A14) is strictly positive and bounded, so by the intermediate value theorem (IVT) there exists a solution $\alpha_L^* \in (\alpha^K, \infty)$ to (A14). Similarly, the left-hand side of (A15) is strictly negative and bounded, so by the IVT, there exists a solution $\alpha_L^\flat \in (\hat{\alpha}, \alpha^K)$ to (A15).

Define $\alpha_F^* := \alpha_{F,1}(\alpha_L^*)$ and $\alpha_F^\flat = \alpha_{F,2}(\alpha_L^\flat)$. By definition, both (α_L^*, α_F^*) and $(\alpha_L^\flat, \alpha_F^\flat)$ are candidate signaling pairs.

To assess other candidate signaling pairs, we derive a polynomial equation such that (α_L, α_F) is a candidate signaling pair only if α_L is a root of this equation. By squaring either (A14) or (A15), we obtain the necessary condition

$$\frac{\sigma^4 + \alpha_L^2\sigma^2\phi}{\sigma^2\phi + \alpha_L^2(-(\rho)^2 + (\phi)^2)} = \left(\frac{(\rho + \phi + \phi\alpha_L)(\alpha_L^2\phi - \sigma^2)}{\rho[\sigma^2 - \alpha_L(1 + \alpha_L)\phi]}\right)^2, \tag{A25}$$

and by cross-multiplying, we obtain the eighth-degree polynomial equation

$$0 = Q(\alpha_L; \rho) = \sum_{i=0}^{8} A_i \alpha_L^i, \qquad \text{where} \tag{A26}$$

$$\begin{aligned}
A_8 &= \phi^4(\rho^2 - \phi^2),\\
A_7 &= 2(\rho - \phi)\phi^3(\rho + \phi)^2,\\
A_6 &= \phi^2(\rho^2 - \phi^2)[\rho^2 + 2\rho\phi + \phi(-\sigma^2 + \phi)],\\
A_5 &= 2\sigma^2\phi^2[-2\rho^3 - \rho^2\phi + \rho\phi^2 + \phi^3],\\
A_4 &= \sigma^2\phi[-2\rho^4 - 4\rho^3\phi + 2\rho\phi^3 + \phi^3(\sigma^2 + \phi)],\\
A_3 &= 2\sigma^4\phi[\rho^3 + \rho^2\phi + \rho\phi^2 + \phi^3],\\
A_2 &= \sigma^4[\rho^4 + 2\rho^3\phi + 2\rho\phi^3 + \phi^3(-\sigma^2 + \phi) + \rho^2\phi(-\sigma^2 + 3\phi)],\\
A_1 &= -2\sigma^6\phi[\rho^2 + \phi\rho + \phi^2],\\
A_0 &= \sigma^6[\rho^2(\sigma^2 - \phi) - 2\rho\phi^2 - \phi^3].
\end{aligned}$$

The exact coefficients are provided for completeness; what matters in what follows is the overall structure of Q and its behavior as $\rho \to 0$. Being an eighth-degree polynomial, $Q(\cdot; \rho)$ has exactly eight complex roots, counting multiplicity; two of these are α_L^* and $\alpha_L^\flat$.

We now show that of all candidate signaling pairs, when $|\rho|$ is sufficiently small, only (α_L^*, α_F^*) satisfies both activists' SOCs. To that end, it is useful to approximate all of the roots of (A26) for small $|\rho|$. We make use of a standard result on the continuous dependence of the (complex) roots of a polynomial on its coefficients:

LEMMA A2: *(Uherka and Sergott (1977)) Let* $p(x) = x^n + \sum_{i=1}^{n} a_i x^{n-i}$ *and* $p^*(x) = x^n + \sum_{i=1}^{n} a_i^* x^{n-i}$ *be two degree-n polynomials. Suppose* λ^* *is a root of* p^* *with multiplicity* m *and* $\epsilon > 0$. *Then for* $|a_i - a_i^*|$ *sufficiently small* $(i = 1, \ldots, n)$, p *has at least* m *roots within* ϵ *of* λ^*.

For a proof, see Uherka and Sergott (1977) and the references therein.

We apply this lemma to the polynomial Q indexed by ρ. (While Lemma A2 assumes a leading coefficient of 1, we can divide through our polynomial $Q(\cdot;\rho)$ in (A26) by A_8, which is bounded away from 0 provided that $|\rho| < |\phi|$, allowing us to apply the lemma.) In the limit as $\rho \to 0$, the polynomial is

$$Q(\alpha_L; 0) = -(1+\alpha_L)^2\phi^3(\sigma^2 - \alpha_L^2\phi)^2(\sigma^2 + \alpha_L^2\phi).$$

By inspection, $Q(\cdot;0)$ is nonpositive and has double roots at -1 and $\pm\alpha^K$, and has complex roots at $\pm\alpha^K i$.

Lemma A2 then has two important implications about candidate signaling pairs. We state the first one as a corollary.

COROLLARY A1: *As $\rho \to 0$, we have $\alpha_L^* \to \alpha^K$, $\alpha_L^\flat \to \alpha^K$, $\alpha_F^* \to \alpha^K$, and $\alpha_F^\flat \to -\alpha^K$.*

Since $\alpha_L^*, \alpha_L^\flat \geq 0$, these can only converge to α^K (among the roots of $Q(\cdot;0)$); the corresponding limits of α_F^* and $\alpha_F^\flat$ are then immediate. The second implication of Lemma A2 is that for any $\epsilon > 0$, there exists $\overline{\rho} > 0$ such that for all ρ with $0 < |\rho| < \overline{\rho}$, the six other roots of $Q(\cdot;\rho)$ all lie within ϵ of -1, $-\alpha^K$, or $\pm\alpha^K i$. Hence, for such ρ, α_L^* and $\alpha_L^\flat$ are roots with multiplicity 1, and they are uniquely defined.

We can now check SOCs for the leader in Lemma A3 and the follower in Lemma A4.

LEMMA A3: *For $|\rho| > 0$ sufficiently small, the candidate signaling pairs (α_L^*, α_F^*) and $(\alpha_L^\flat, \alpha_F^\flat)$ satisfy (A12) and are the only candidate signaling pairs that do.*

PROOF: We first show that (α_L^*, α_F^*) satisfy (A12) for sufficiently small $|\rho| > 0$. As $\rho \to 0$, the right-hand side of (A12) tends to $\sigma^2 - (\alpha^K)^2\phi - 2\alpha^K\phi = -2\sigma\sqrt{\phi} < 0$, where we use $\alpha_L^* \to \alpha^K$ by Corollary A1. A nearly identical calculation shows that $(\alpha_L^\flat, \alpha_F^\flat)$ also satisfy (A12) for sufficiently small $|\rho| > 0$.

The remaining candidates for equilibria are associated with the real roots of (A26) other than $\alpha_L^*, \alpha_L^\flat$. By Lemma A2, as $\rho \to 0$, these roots must converge to the other roots of $Q(\cdot;0)$, namely, -1, $-\alpha^K$, or $\pm\alpha^K i$. Any root of $Q(\cdot;\rho)$ that is in a sufficiently small neighborhood of $\pm\alpha^K i$ has a nonzero complex component and is not an equilibrium candidate. Therefore, we need only consider candidates in neighborhoods of -1 or $-\alpha^K$. In the first case, for any $\alpha_F \in \{\alpha_{F,1}, \alpha_{F,2}\}$, the right-hand side of (A12) converges to $\sigma^2 - (-1)^2\phi - 2(-1)\phi = \sigma^2 + \phi > 0$. In the second case, for any $\alpha_F \in \{\alpha_{F,1}, \alpha_{F,2}\}$, the right-hand side of (A12) converges to $\sigma^2 - \left(-\alpha^K\right)^2\phi - 2\left(-\alpha^K\right)\phi = 2\sigma\sqrt{\phi} > 0$. Thus, for $|\rho| > 0$ sufficiently small, all roots of $Q(\cdot;\rho)$ other than α_L^* and $\alpha_L^\flat$ violate the leader's SOC. □

LEMMA A4: *For $|\rho| > 0$ sufficiently small, the candidate signaling pair (α_L^*, α_F^*) satisfies (A13), while the pair $(\alpha_L^\flat, \alpha_F^\flat)$ does not.*

PROOF: For the pair (α_L^*, α_F^*), the right-hand side of (A13) tends to $-\alpha^K[\sigma^2\phi + (\alpha^K)^2\phi^2] < 0$ as $\rho \to 0$. For the pair $(\alpha_L^\flat, \alpha_F^\flat)$, it tends to $\alpha^K[\sigma^2\phi + (\alpha^K)^2\phi^2] > 0$, violating (A13). □

To conclude the proof of Proposition A4, from Lemmas A3 and A4, we have that for $|\rho| > 0$ sufficiently small, (α_L^*, α_F^*) is the unique candidate signaling pair satisfying both (A12) and (A13). Hence, in any linear equilibrium, (α_L, α_F) must equal (α_L^*, α_F^*). As $\rho \to 0$, $\phi(1+\alpha_L^*) + \rho \to \phi(1+\alpha^K) > 0$, allowing us to apply the "converse" part of Proposition A1 when $|\rho|$ is sufficiently small, giving us existence. Since we have already shown that $0 < \alpha_L^* < \alpha^K$ if $\rho > 0$, (A11) implies $-\delta_L > \alpha^K$ in this case; likewise, when $\rho < 0$, we have $\alpha_L^* > \alpha^K$, which implies $0 < -\delta_L < \alpha^K$. □

By the results above, a unique PBS equilibrium exists if ρ is positive or sufficiently close to zero. Thus, $\underline{\rho} := \inf\{\rho' \in [-\phi, \phi] :$ a PBS equilibrium exists for all $\rho \in [\rho', \phi]\} < 0$, and $\rho_0 := \inf\{\rho' \in [-\phi, \phi] :$ a unique PBS equilibrium exists for all $\rho \in [\rho', \phi]\} < 0$, where $\rho_0 \geq \underline{\rho}$ is obvious. To show that $\underline{\rho} > -\phi$, we invoke the following result.

PROPOSITION A5: *Fix $\sigma, \phi > 0$. There exists $\hat{\rho} \in (-\phi, 0)$ such that if $\rho < \hat{\rho}$, there is no PBS equilibrium.*

PROOF: The proof is based on the following two lemmas.

LEMMA A5: *There is no $[-\phi, \phi]$-valued sequence $(\rho_n)_{n\in\mathbb{N}}$ that converges to $-\phi$ and has the property that there is an associated sequence of PBS equilibria such that $(\alpha_{F,n})_{n\in\mathbb{N}}$ is bounded.*

PROOF: Suppose by way of contradiction that there exists such a sequence with associated PBS equilibria indexed by n. We claim that $(\alpha_{L,n})_{n\in\mathbb{N}}$ is bounded. To see this, take n sufficiently large that $\rho_n \neq 0$, and note that the right-hand side of (A14) must be bounded, since it equals $\alpha_{F,n}$ which we have supposed is bounded. Since the numerator on the right-hand side is cubic while the denominator is quadratic, it must be the case that $(\alpha_{L,n})_{n\in\mathbb{N}}$ is bounded.

Given that $(\alpha_{F,n})_{n\in\mathbb{N}}$ and $(\alpha_{L,n})_{n\in\mathbb{N}}$ are both bounded, we can pass to a subsequence and relabel such that $\alpha_{F,n} \to \overline{\alpha}_F \geq 0$ and $\alpha_{L,n} \to \overline{\alpha}_L \geq 0$, where the inequalities follow from $\alpha_{F,n}, \alpha_{L,n} \geq 0$ in PBS equilibria by definition. Then, taking limits in (A14), we have

$$\overline{\alpha}_F = \sqrt{\frac{\sigma^2}{\phi} + \overline{\alpha}_L^2} > \overline{\alpha}_L. \tag{A27}$$

The right-hand side of (A12) thus has limit

$$\sigma^2 + \overline{\alpha}_L^2\phi - 2\overline{\alpha}_L[-\phi(1+\overline{\alpha}_F) + \phi(1+\overline{\alpha}_L)] = \sigma^2 + \overline{\alpha}_L^2\phi + 2\overline{\alpha}_L\phi(\overline{\alpha}_F - \overline{\alpha}_L) > 0, \tag{A28}$$

where $\overline{\alpha}_F - \overline{\alpha}_L > 0$ by (A27). But since (A12) is satisfied for all n, this limit must be nonpositive, a contradiction. □

LEMMA A6: *There is no $[-\phi, \phi]$-valued sequence $(\rho_n)_{n\in\mathbb{N}}$ that converges to $-\phi$ and has the property that there is an associated sequence of PBS equilibria such that $(\alpha_{F,n}) \to +\infty$.*

PROOF: Suppose by way of contradiction that there were such a sequence. From the expression for $\alpha_{F,n}$ in (A14), it must be the case that $\alpha_{L,n} \to +\infty$. We claim that $\frac{\alpha_{F_n}}{\alpha_{L,n}} \to 1$. To obtain this, divide (A14) through by $\alpha_{L,n}$ to get

$$\frac{\alpha_{F_n}}{\alpha_{L,n}} = \frac{(\rho_n + \phi + \phi\alpha_{L,n})(\alpha_L^2\phi - \sigma^2)}{\rho_n\alpha_{L,n}\left[\sigma^2 - \alpha_{L,n}(1+\alpha_{L,n})\phi\right]} \to 1.$$

We now show that (A12) eventually fails. The right-hand side of (A12) rearranges to

$$\sigma^2 + \alpha_{L,n}^2\phi - 2\alpha_{L,n}[\phi + \rho_n + \alpha_{L,n}(\rho_n\alpha_{F,n}/\alpha_{L,n} + \phi)]. \tag{A29}$$

Since $\phi + \rho_n \to 0$ and $\frac{\alpha_{F,n}}{\alpha_{L,n}} \to 1$, for any $\epsilon > 0$, the expression in square brackets in (A29) is less than $\epsilon\alpha_{L,n}$ for sufficiently large n. Hence, (A29) is eventually greater than $\sigma^2 + \alpha_{L,n}^2\phi - 2\epsilon\alpha_{L,n}^2$, which is positive for $\epsilon < \phi/2$, violating (A12), contradicting equilibrium. □

The existence of $\hat{\rho} > -\phi$ then follows immediately from Lemmas A5 and A6, since if there is no such $\hat{\rho}$ there would exist a sequence $(\rho_n)_{n\in\mathbb{N}}$ with $\rho_n \to -\phi$ and an associated sequence of PBS equilibria such that either $\alpha_{F,n} \to +\infty$ along some subsequence (which is ruled out by Lemma A6) or $(\alpha_{F,n})_{n\in\mathbb{N}}$ is bounded (ruled out by Lemma A5). Since Proposition A4 shows that a PBS equilibrium exists for some $\rho < 0$, we have $\hat{\rho} < 0$. □

For any $\hat{\rho}$ as in Proposition A5, $\underline{\rho} \geq \hat{\rho} > -\phi$. This concludes the proof of Theorem 1.

E. Monotonicity of Leader's Strategy Coefficients

The following result establishes the decreasing patterns of α_L and δ_L with respect to ρ shown in Figure 1. Note that Proposition A2 establishes that when $\rho = 0$, we have $\alpha_L = \alpha^K = -\delta_L$.

PROPOSITION A6: *Suppose $\rho > \rho_0$, where $\rho_0 < 0$ is defined in the proof of Theorem 1. Then in the unique PBS equilibrium, α_L and δ_L are decreasing in ρ.*

PROOF: Due to the identity (A11), it is sufficient to prove the claim for α_L. First suppose $\rho > 0$. The right-hand side of (A14) crosses the left-hand side from above at α_L. Moreover, when $\rho > 0$, the right-hand side is positive and decreasing in ρ at α_L while the left-hand side is increasing in ρ. Hence, α_L is decreasing in ρ. In turn, when $\rho < 0$, the right-hand side of (A14) crosses the left-hand side from below, the left-hand side is decreasing in ρ, and the right-hand side is increasing in ρ at α_L. Hence, α_L is again unambiguously decreasing in ρ. The result then follows since α_L is continuous in ρ at $\rho = 0$ by Corollary A1. □

F. Proof of Proposition 1

For both parts (i) and (ii), we focus on equilibria with positive weight on private information, that is, linear equilibria in which

$$\theta^L := \alpha_L \xi^L + \delta_L \mu + \eta_L,$$
$$\theta^F := \alpha_F \xi^F + \beta_F P_1 + \delta_F \mu + \eta_F$$

for $\xi \in \{V, \zeta\}$, where $\alpha_L, \alpha_F > 0$. Relative to the baseline model, this definition allows for an intercept η that is independent of μ, a feature that will turn out to be crucial in the leader's strategy—in the baseline model, however, it is easy to see from FOCs that such a coefficient is always zero for both players. Let us briefly anticipate the role of this new intercept.

As a preliminary, notice that the firm's true value now takes the form $X_T^L + X_T^F + \xi^L + \xi^F$, $\xi \in \{V, \zeta\}$. From here, it is easy to see that the follower's FOC reads $\theta^F \Lambda_2 = \mathbb{E}_F[X_T^F + X_T^L + \xi^L + \xi^F] - \mathbb{E}_F[P_2]$, where Λ_2 is the sensitivity of the (linear) price P_2 to the realized $t = 2$ order flow. Taking expectations with respect to $\mathcal{F}_1$ on both sides of the last equality, while using the law of iterated expectations and the fact that strategies are correctly anticipated in equilibrium, we conclude that $\mathbb{E}[\theta^F | \mathcal{F}_1] = 0$ as in the baseline model.

Consequently, in a linear equilibrium, the follower's strategy above must admit the representation $\theta^F = \alpha_F(\xi^F - \mathbb{E}[\xi^F | \mathcal{F}_1])$. Equipped with this, we will show that, as long as ρ is not too negative, there exists a unique equilibrium (within the class of linear equilibria with positive weights on private information), and the leader trades according to

$$\theta^L = \alpha^K(\xi^L - \mu) + \eta_L. \tag{A30}$$

Here, $\alpha^K = \sigma/\sqrt{\phi}$ is the traditional Kyle coefficient (as defined originally) while $\eta_L = X_0^L \frac{\beta_F}{1-\beta_F}$, where $\beta_F < 1$ and $\text{sign}(\beta_F) = -\text{sign}(\rho)$. Thus, $\text{sign}(\mathbb{E}[\theta^L | \mathcal{F}_0]) = \text{sign}(\eta_L) = -\text{sign}(\rho)$, implying buy or sell orders are linked to the type of correlation as in the baseline model, but now via η_L. An implication is that the leader's terminal position,

$$X_0^L + \alpha^K(\xi^L - \mu) + \frac{\beta_F}{1-\beta_F} X_0^L = \alpha^K(\xi^L - \mu) + \frac{X_0^L}{1-\beta_F} \tag{A31}$$

is increasing in her initial position X_0^L due to $\beta_F < 1$.

F.1. Proposition 1 Part (i)

Suppose that $\xi = V$. As just argued, the firm's final value will be $V^L + V^F + X_T^L + X_T^F$, where $X_T^i = X_0^i + \theta^i$ as before. Hence, the objective of activist i reduces to

$$\sup_{\theta^i} \mathbb{E}[(V^L + V^F + X_T^i + X_T^{-i}) X_T^i - P_{t(i)} \theta^i - \frac{1}{2}(X_T^i)^2 | V^i, \mathcal{F}_{t(i)-1}].$$

We now proceed with all the details paralleling the steps taken in the baseline model.

Learning and Pricing. Conjecture linear strategies (with a gap strategy for the follower). The ex ante expectation of firm value is

$$P_0 = X_0^L + X_0^F + \eta_L + (2 + \alpha_L + \delta_L)\mu,$$

where we use the fact that the follower's expected trade is zero from an ex ante perspective. Since the type distribution is unchanged, the activists' private prior beliefs about each other's initial positions have the same form as in the baseline model: we denote each prior by Y_0^i, which is linear in V^i according to the same expression for our original Y_0^i in Lemma 1, but replacing X_0^i with V^i, $i = L, F$.

Given Ψ_1, the market maker's updated belief about V^L is

$$M_1^L := \mathbb{E}[V^L|\mathcal{F}_1] = \mu + \frac{\alpha_L\phi}{\alpha_L^2\phi + \sigma^2}\big\{\Psi_1 - \mu(\alpha_L + \delta_L) - \eta_L\big\},$$

and the market maker's updated belief about V^F is

$$M_1^F := \mathbb{E}[V^F|\mathcal{F}_1] = \mu + \frac{\alpha_L\rho}{\alpha_L^2\phi + \sigma^2}\big\{\Psi_1 - \mu(\alpha_L + \delta_L) - \eta_L\big\}.$$

Since the market maker expects the follower to trade zero conditional on first-period order flow,

$$\begin{aligned} P_1 &= X_0^L + X_0^F + \eta_L + \mathbb{E}[V^L + V^F + \theta^L|\Psi_1] \\ &= X_0^L + X_0^F + \eta_L + M_1^L(1 + \alpha_L) + \delta_L\mu + M_1^F \\ &= P_0 + \Lambda_1\big\{\Psi_1 - \mu(\alpha_L + \delta_L) - \eta_L\big\}, \end{aligned}$$

where $\Lambda_1 := \frac{\alpha_L[\rho+(1+\alpha_L)\phi]}{\alpha_L^2\phi+\sigma^2}$. This is identical (up to a possibly different value of α_L) to Λ_1 in the baseline model, using the identity (A8) that β_F satisfies in a gap strategy. Note that $\Lambda_1 > 0$ for any $\alpha_L > 0$, since $\rho + \phi \geq 0$.

The market maker's posterior belief about (V^L, V^F) has covariance matrix $\begin{pmatrix} \gamma_1^L & \rho_1 \\ \rho_1 & \gamma_1^F \end{pmatrix}$, where

$$\gamma_1^L = \frac{\phi\sigma^2}{\alpha_L^2\phi + \sigma^2}, \qquad \gamma_1^F = \frac{\alpha_L^2[\phi^2 - \rho^2] + \phi\sigma^2}{\alpha_L^2\phi + \sigma^2}, \qquad \rho_1 = \frac{\rho\sigma^2}{\alpha_L^2\phi + \sigma^2}.$$

The follower's mean posterior belief about the leader's component V^L is

$$Y_1^F := Y_0^F + \frac{\alpha_L\nu_0^F}{\alpha_L^2\nu_0^F + \sigma^2}\underbrace{\left\{\frac{P_1 - P_0}{\Lambda_1} + \alpha_L(\mu - Y_0^F)\right\}}_{=\Psi_1 - (\alpha_L Y_0^F + \delta_L\mu) - \eta_L}.$$

After seeing Ψ_2, the market maker again updates beliefs about V^L and V^F:

$$M_2^F := M_1^F + \frac{\alpha_F \gamma_1^F}{\alpha_F^2 \gamma_1^F + \sigma^2}\Psi_2 \quad \text{and} \quad M_2^L := M_1^L + \frac{\alpha_F \rho_1}{\alpha_F^2 \gamma_1^F + \sigma^2}\Psi_2.$$

The price is then

$$P_2 = P_1 + \Psi_2 \underbrace{\frac{\alpha_F[(1+\alpha_L)\rho_1 + (1+\alpha_F)\gamma_1^F]}{\alpha_F^2 \gamma_1^F + \sigma^2}}_{=:\Lambda_2}.$$

This Λ_2 is equivalent to the one in the baseline model.

Optimality Conditions and Equilibrium Characterization. The follower's FOC is

$$0 = \mathbb{E}_F[V^L + \theta^L] + V^F + X_0^L + X_0^F + \theta^F - P_1 - 2\Lambda_2\theta^F$$
$$\Rightarrow \theta^F = \frac{Y_1^F(1+\alpha_L) + \delta_L\mu + \eta_L + V^F + X_0^L + X_0^F - P_1}{2\Lambda_2 - 1}.$$

From here, we can construct equilibrium conditions for the coefficients in the follower's strategy. This is done in the following manner: first, we insert the original strategy $\theta^F = \alpha_F\xi^F + \beta_F P_1 + \delta_F\mu + \eta_F$ on the left side; second, using the expression for Y_1^F above, we write the latter variable as a linear function of P_1, also using the expressions for P_0 and Y_0^F; third, we collect terms on the right to construct an affine function of V^F, P_1, μ; fourth, and finally, we impose equality across the terms multiplying the previous coefficients and the constant.

The details of all these tedious steps can be found in the Mathematica file OtherPrivateInfo.nb in the replication package. What matters is that the imposed equilibrium conditions result in a system of equations of the form

$$\alpha_F = \frac{AB}{CD}, \tag{A32}$$

$$\beta_F = \frac{-\rho AB}{ECD}, \tag{A33}$$

$$\delta_F = \frac{FAB}{ECD}, \tag{A34}$$

$$\eta_F = \frac{\rho GAB}{ECD}, \tag{A35}$$

where

$$A = -\alpha_L\rho\sigma^2 - \sigma^2(\rho+\phi) + \alpha_L^2(\rho-\phi)(\rho+\phi),$$

$$B = -\sigma^2(\sigma^2 + \alpha_L^2\phi) + \alpha_F^2\big(-\sigma^2\phi + \alpha_L^2(\rho-\phi)(\rho+\phi)\big),$$
$$C = 2\alpha_F\alpha_L^2\rho^2 + \alpha_F^2\alpha_L^2\rho^2 - 2\alpha_F\rho\sigma^2 - 2\alpha_F\alpha_L\rho\sigma^2 + \sigma^4 + \big(-\alpha_F(2+\alpha_F) + \alpha_L^2\big)\sigma^2\phi - \alpha_F(2+\alpha_F)\alpha_L^2\phi^2,$$
$$D = -\sigma^2\phi + \alpha_L^2(\rho-\phi)(\rho+\phi),$$
$$E = \rho + \phi + \alpha_L\phi,$$
$$F = (1+\alpha_L+\delta_L)\rho - (1+\alpha_L)\phi,$$
$$G = X_0^F + X_0^L + \eta_L.$$

In this system, the denominators are nonzero when the follower's SOC is satisfied: it is easy to see from this player's problem that his SOC is $1 - 2\Lambda_2 < 0$ (it has the same functional form as in the baseline model), which implies the above optimality condition for θ^F will have a denominator that is nonzero.[42]

We first argue that there is a unique $\alpha_F > 0$, up to α_L, solving (A32) consistent with the SOCs. Cross-multiplying in (A32) yields a cubic in α_F with three solutions:

$$\pm\sqrt{\frac{\sigma^2}{\gamma_1^F}} \quad \text{and} \quad -\frac{\alpha_L\rho\sigma^2 + \sigma^2(\rho+\phi) + \alpha_L^2(\phi^2-\rho^2)}{\alpha_L^2(\phi^2-\rho^2) + \sigma^2\phi}.$$

Of the first two roots, we reject the negative one, and the third root induces $\Lambda_2 = 0$, which fails the follower's SOC. Hence, we have $\alpha_F = \sqrt{\frac{\sigma^2}{\gamma_1^F}}$.

After substituting in α_F for $\frac{AB}{CD}$ and given α_F in terms of α_L, the solutions $\beta_F = -\frac{\rho\alpha_F}{\phi(1+\alpha_L)+\rho}$, $\delta_F = \frac{(\alpha_L+\delta_L)\rho - \alpha_L\phi - (\phi-\rho)}{\phi(1+\alpha_L)+\rho}\alpha_F$, and $\eta_F = -\beta_F(X_0^L + X_0^F + \eta_L)$ are immediate from (A33) to (A35). Note that β_F has the opposite sign of ρ, as asserted earlier in the proof.

It is straightforward to check that for these coefficients, the follower's strategy $\theta^F = \alpha_F\xi^F + \beta_F P_1 + \delta_F\mu + \eta_F$ is equivalent to $\alpha_F(V^F - M_1^F)$ for $\alpha_F = \sqrt{\sigma^2/\gamma_1^F}$.

The leader's FOC is

$$\begin{aligned}0 &= -\mathbb{E}_L[P_0 + \Lambda_1\{\Psi_1 - \mathbb{E}[\Psi_1]\}] - \theta^L\Lambda_1 \\ &\quad + \underbrace{(X_0^L + \theta^L) + V^L + Y_0^L + \mathbb{E}_L[X_T^F]}_{=\mathbb{E}_L[\text{firm value}]} + \underbrace{(X_0^L + \theta^L)\overbrace{\frac{\partial \mathbb{E}_L[X_T^F]}{\partial\theta^L}}^{=\Lambda_1\beta_F}}_{\text{value of manipulation}} \qquad \text{(A36)} \\ &= -\mathbb{E}_L[P_1] - \theta^L\Lambda_1 + V^L + Y_0^L(1+\alpha_F) + \beta_F\mathbb{E}_L[P_1] + \delta_F\mu + \eta_F \\ &\quad + \big(X_0^L + \theta^L\big)(1 + \beta_F\Lambda_1).\end{aligned}$$

[42] A multiplicative term E appears in both the numerator and denominator of the right-hand side in (A32), explaining its absence in the denominator.

Following an identical procedure to the one used for the follower, we can replace θ^L by our candidate linear equilibrium strategy in the previous expression to construct equations associated with the coefficients on V^L, μ, as well as the intercept, all being equal to zero. Furthermore, after substituting in the follower's coefficients derived previously, we obtain three equations:

$$0 = \frac{(\sigma^2 - \alpha_L^2\phi)(\rho + \phi + \alpha_L\phi + \rho\alpha_F)}{\phi(\alpha_L^2\phi + \sigma^2)}, \tag{A37}$$

$$0 = \frac{(\sigma^2 + \alpha_L\delta_L\phi)(\rho + \phi + \alpha_L\phi + \rho\alpha_F)}{\phi(\alpha_L^2\phi + \sigma^2)}, \tag{A38}$$

$$0 = -\frac{\alpha_L(\rho + \phi + \alpha_L\phi)\left(\eta_L + \frac{(X_0^L + \eta_L)\rho\alpha_F}{\rho + \phi + \alpha_L\phi}\right)}{\alpha_L^2\phi + \sigma^2}. \tag{A39}$$

(The reader interested in replicating these steps can see the Mathematica file previously referenced.) In turn, it is easy to see that the leader's SOC reads $1 - 2\Lambda_1(1 - \beta_F) < 0$, and so it is also unchanged relative to the baseline case.

In (A37), the second factor in the numerator must be nonzero; otherwise, we would have $\beta_F = -\frac{\rho\alpha_F}{\phi(1+\alpha_L)+\rho} = 1$, violating the leader's SOC. Hence, the first factor must be 0 and the condition $\alpha_L > 0$ yields the unique solution $\alpha_L = \alpha^K$. From (A38) it follows that $\delta_L = -\alpha^K$. Now in (A39), we must have $\rho + \phi + \alpha_L\phi > 0$ since $\alpha_L > 0$, and therefore $\eta_L + \frac{(X_0^L + \eta_L)\rho\alpha_F}{\rho + \phi + \alpha_L\phi}$ which yields $\eta_L = -X_0^L \frac{\rho\alpha_F}{\rho(1+\alpha_F)+\phi(1+\alpha_L)} = X_0^L \frac{\beta_F}{1-\beta_F}$ as anticipated at the beginning of the proof.

It remains to show that the SOCs are satisfied. By direct substitution of our closed-form solution,

$$1 - 2\Lambda_1(1 - \beta_F) = -\frac{\phi + \rho + \sqrt{2}\rho\sqrt{\frac{\sigma^2\phi}{2\phi^2 - \rho^2}}}{\sigma\sqrt{\phi}},$$

$$1 - 2\Lambda_2 = -\frac{\sqrt{\frac{\sigma^2\phi}{2\phi^2 - \rho^2}}\,[2\phi^2 - \rho^2 + \rho(\sigma\sqrt{\phi} + \phi)]}{\sqrt{2}\sigma^2\phi}.$$

By inspection, both expressions are negative if $\rho \geq 0$ or $\rho < 0$ but is sufficiently close to zero. Thus, there exists $\underline{\rho} \in (-\phi, 0)$ such that both are satisfied when $\rho \geq \underline{\rho}$. Also, recalling that $\Lambda_1 > 0$ by inspection, the leader's SOC implies $\beta_F < 1$. Since $\text{sign}(\beta_F) = -\text{sign}(\rho)$, it follows that $\text{sign}(\mathbb{E}[\theta^L|\mathcal{F}_0]) = \text{sign}(\eta_L) = -\text{sign}(\rho)$: the leader sells (buys) on average when correlation is positive (negative).

F.2. Proposition 1 Part (ii)

Given the new term $\zeta^i W^i$ in the cost function, trader i's optimal effort is $X_T^i + \zeta^i$. Hence, the firm's value is $X_T^i + X_T^{-i} + \zeta^i + \zeta^{-i}$ as we anticipated, while trader i's payoff from any strategy θ^i is

$$\mathbb{E}\left[(X_T^i + X_T^{-i} + \zeta^i + \zeta^{-i})X_T^i - P_{t(i)}\theta^i - \frac{1}{2}(X_T^i + \zeta^i)^2 + \zeta^i(X_T^i + \zeta^i)\middle|\zeta^i, \mathcal{F}_{t(i)-1}\right]$$
$$= \mathbb{E}\left[(X_T^i + X_T^{-i} + \zeta^i + \zeta^{-i})X_T^i - P_{t(i)}\theta^i - \frac{1}{2}(X_T^i)^2 + \frac{1}{2}(\zeta^i)^2\middle|\zeta^i, \mathcal{F}_{t(i)-1}\right].$$

Because the $\frac{(\zeta^i)^2}{2}$ term is strategically irrelevant, trader i solves

$$\sup_{\theta^i} \mathbb{E}\left[(X_T^i + X_T^{-i} + \zeta^i + \zeta^{-i})X_T^i - P_{t(i)}\theta^i - \frac{1}{2}(X_T^i)^2\middle|\zeta^i, \mathcal{F}_{t(i)-1}\right].$$

Observe that this problem is the same as in the variation from part (i) of the proposition, with ζ^i in the place of V^i. As the information structure from the switch $V^i \leftrightarrow \zeta^i$ is also unchanged, the equilibria are the same as in part (i).

G. Proof of Theorem 2

Part (i). Ex ante expected firm value is $\mathbb{E}[W^L + W^F] = \mathbb{E}[X_0^L + \theta^L + X_0^F + \theta^F] = 2\mu + \mathbb{E}[\theta^L]$, where we use the fact that terminal efforts coincide with terminal positions, and we use $\mathbb{E}[\theta^F] = 0$. The inequality $\mathbb{E}[W^L + W^F] \le 2\mu$ is therefore equivalent to $\mathbb{E}[\theta^L] \le 0$, which holds iff $\rho \le 0$ (with strict inequality if $\rho \neq 0$) by Theorem 1. Moreover, since $\mathbb{E}[\theta^L] = (\alpha_L + \delta_L)\mu$, we have $\mathbb{E}[W^L + W^F] = (2 + \alpha_L + \delta_L)\mu$, which is monotone decreasing in ρ by Proposition A6.

Part (ii). We show that $\alpha_L + \delta_L > -1$. Using (A11), we have $\alpha_L + \delta_L = \alpha_L - \frac{\sigma^2}{\phi\alpha_L} =: h(\alpha_L)$. Note that h is increasing in α_L for $\alpha_L > 0$, and from the proof of Proposition A3, $\alpha_L > \hat{\alpha}$. By direct calculation, $h(\hat{\alpha}) = -1$, so we are done.

Part (iii). Fix $\rho > 0$. For part (iii.1), we begin with some useful preliminary observations. Recall from the proof of Proposition A3 that $\hat{\alpha} < \alpha_L < \alpha^K$. But $\lim_{\sigma\to+\infty} \frac{\hat{\alpha}}{\sigma} = 1/\sqrt{\phi} = \lim_{\sigma\to+\infty} \frac{\alpha^K}{\sigma}$, so $\lim_{\sigma\to+\infty} \frac{\alpha_L}{\sigma} = 1/\sqrt{\phi}$. Then by (A11), $\lim_{\sigma\to+\infty} \frac{\delta_L}{\sigma} = -1/\sqrt{\phi}$. These limits imply $\lim_{\sigma\to+\infty} \alpha_L = +\infty$ and $\lim_{\sigma\to+\infty} \delta_L = -\infty$. Let $x_L := \alpha_L/\sigma$ and $x_F := \alpha_F/\sigma$.

For the first limit in part (iii.1), recall from above that x_L converges to a positive constant as $\sigma \to +\infty$. Using the expression for α_F in (A14), it is easy to see that x_F also converges to a positive constant as $\sigma \to +\infty$. Now $\mathbb{E}[\theta^L] = \mu(\alpha_L + \delta_L)$, and from (A10) and (A11), $\alpha_L + \delta_L = -\frac{\rho\alpha_F}{\phi(1+\alpha_L)+\rho(1+\alpha_F)} = -\frac{\rho x_F}{(\rho+\phi)/\sigma+\phi x_L+\rho x_F}$, which converges to a negative constant as $\sigma \to +\infty$ since both x_L and x_F converge to positive constants.

For the second limit in part (iii.1), note that $\alpha_L - \alpha^K = \frac{\alpha_L}{\alpha_L+\alpha^K}\left(\alpha_L - \frac{(\alpha^K)^2}{\alpha_L}\right)$. The first factor is $\frac{x_L}{x_L+1/\sqrt{\phi}}$, which has a finite positive limit as $\sigma \to +\infty$, and the second equals $\alpha_L + \delta_L$, which, as we just argue, converges to a finite negative limit. Hence, $\lim\limits_{\sigma\to+\infty}(\alpha_L - \alpha^K) \in (-\infty, 0)$.

For part (iii.2), from the proof of Proposition 8, in the PBS equilibrium, α_L/σ converges to a positive constant as $\sigma \to 0$, so it follows that $\lim_{\sigma\to 0}\alpha_L = 0$. By (A11), $\delta_L/\sigma = -1/(\phi\alpha_L/\sigma)$ converges to a negative constant, and thus $\lim_{\sigma\to 0}\delta_L = 0$. Therefore, $\lim_{\sigma\to 0}\mathbb{E}[\theta^L] = \lim_{\sigma\to 0}((\alpha_L+\delta_L)\mu) = 0$ and $\lim_{\sigma\to 0}(\alpha_L - \sqrt{\sigma^2/\phi}) = 0 - 0 = 0$.

H. Proof of Proposition 5

We consider symmetric linear strategies of the form

$$\theta^i = \alpha X_0^i + \beta\mu. \tag{A40}$$

We begin by characterizing belief updating and pricing. We then use these to set up the best-response problem of either trader. We show that in any symmetric PBS equilibrium, $\alpha = \frac{\sigma}{\sqrt{2\phi}}$. We next show that there exists $\rho_0^{\text{sim}} \in (-\phi, 0)$ such that for all $\rho \in [\rho_0^{\text{sim}}, \phi]$, there exists a unique symmetric PBS equilibrium.

After observing the total order flow, the market maker updates her beliefs about the activists' positions. Given the form of strategies and symmetry, it is sufficient for the market maker to estimate only the sum of initial positions. By the projection theorem,

$$\begin{aligned}\mathbb{E}[X_0^i + X_0^j|\mathcal{F}_1] &= 2\mu + \frac{\text{cov}(X_0^i + X_0^j, \Psi_1)}{\text{var}(\Psi_1)}\left\{\Psi_1 - \underbrace{[2\alpha\mu + 2\beta\mu]}_{=\mathbb{E}[\theta^i+\theta^j]}\right\}\\ &= 2\mu + \frac{2\alpha(\phi+\rho)}{2\alpha^2(\phi+\rho)+\sigma^2}\{\Psi_1 - 2\mu(\alpha+\beta)]\}.\end{aligned}$$

Hence, P_1 is equal to

$$\begin{aligned}P_1 &= \mathbb{E}[W|\mathcal{F}_1] = \mathbb{E}[X_T^i + X_T^j|\mathcal{F}_1] = (1+\alpha)\mathbb{E}[X_0^i + X_0^j|\mathcal{F}_1] + 2\mu\beta\\ &= P_0^S + \Lambda_1^S\{\Psi_1 - 2\mu(\alpha+\beta)\},\end{aligned}$$

where $P_0^S := 2\mu(1+\alpha+\beta)$ is the ex ante expected firm value and $\Lambda_1^S := (1+\alpha)\frac{2\alpha(\phi+\rho)}{2\alpha^2(\phi+\rho)+\sigma^2}$ is Kyle's lambda.

Each activist then maximizes

$$\sup_{\theta^i}\mathbb{E}\left[\frac{(X_0^i+\theta^i)^2 + 2X_T^{-i}(X_0^i+\theta^i)}{2} - P_1\theta^i \middle| X_0^i\right].$$

The FOC is $\frac{2(X_0^i+\theta^i)+2\mathbb{E}[X_T^{-i}|X_0^i]}{2} - \theta^i\frac{\partial P_1}{\partial\theta^i} - P_1 = 0$. Plugging in the expression for Λ_1^S, evaluating at the conjectured strategy (A40), and setting the coefficient on

X_0^i to zero yields an equation for α with the following three roots:

$$\alpha = \frac{\sigma}{\sqrt{2\phi}}, \quad -\frac{\sigma}{\sqrt{2\phi}}, \quad -1. \tag{A41}$$

Similarly, setting the coefficient on μ to zero, we can pin down β from α as

$$\beta = \frac{\sigma^2}{2\sigma^2 - 4\alpha(1+\alpha)\phi}.$$

Since the second and third roots are negative, we have a unique candidate for a symmetric PBS equilibrium. Note that with $\alpha = \frac{\sigma}{\sqrt{2\phi}}$, we have $\beta = -\alpha = -\frac{\sigma}{\sqrt{2\phi}}$.

Equipped with this, we are left with two remaining tasks in the proof.

Existence and uniqueness: For existence, we must check the SOC: $1 - 2\Lambda_1^S \leq 0$. Plugging in $\alpha = \frac{\sigma}{\sqrt{2\phi}}$, this condition is equivalent to the inequality

$$\sigma^2 - 2\alpha(2+\alpha)(\rho+\phi) = \sigma^2 - 2\frac{\sigma}{\sqrt{2\phi}}\left(2 + \frac{\sigma}{\sqrt{2\phi}}\right)(\phi+\rho) \leq 0.$$

The left-hand side is decreasing and continuous in ρ, and it is strictly negative when $\rho = 0$, so there exists $\rho_0^{\text{sim}} \in (-\phi, 0)$ such that the inequality is satisfied, and in turn a unique PBS equilibrium exists, whenever $\rho \in [\rho_0^{\text{sim}}, \phi]$.

Payoff comparison: We now compare payoffs to those in the sequential-move game for the case $\rho = 0$. In this latter game, the equilibrium is characterized in Proposition A2, and $\alpha_L = \alpha_F = \sqrt{\frac{\sigma^2}{\phi}}$ due to the absence of correlation. Furthermore, the players' expected payoffs coincide. To find this value, we plug in the equilibrium strategies into (3) to obtain

$$\mathbb{E}\Bigg[\frac{1}{2}\left(X_0^L\left(1+\sqrt{\frac{\sigma^2}{\phi}}\right) - \sqrt{\frac{\sigma^2}{\phi}}\mu\right)^2 + \left(X_0^F + \sqrt{\frac{\sigma^2}{\phi}}(X_0^F - \mu)\right)\left(X_0^L + \sqrt{\frac{\sigma^2}{\phi}}(X_0^L - \mu)\right)$$
$$-\left(P_0 + \Lambda_1\left(\sqrt{\frac{\sigma^2}{\phi}}(X_0^L - \mu) + \sigma Z_1\right)\right)\sqrt{\frac{\sigma^2}{\phi}}(X_0^L - \mu)\Bigg].$$

Opening up the expectation and simplifying, we can write the first line as $\frac{1}{2}\left(\mu^2 + (\sigma + \sqrt{\phi})^2\right) + \mu^2$ and second line as $-\frac{\sigma(\sigma+\sqrt{\phi})}{2}$. Hence, each trader's total expected payoff when $\rho = 0$ is

$$\frac{1}{2}\Big[3\mu^2 + \phi + \sigma\sqrt{\phi}\Big]. \tag{A42}$$

Turning to the simultaneous-move game, from (A41) the equilibrium coefficient is $\alpha_S := \sqrt{\frac{\sigma^2}{2\phi}}$, with $\alpha_L = \alpha_F > \alpha_S$. And following similar steps for the simultaneous case, we can write the equilibrium payoff of player i ($i = 1, 2$) as

$$\mathbb{E}\Bigg[\frac{1}{2}\Big(X_0^i\Big(1+\sqrt{\tfrac{\sigma^2}{2\phi}}\Big)-\sqrt{\tfrac{\sigma^2}{2\phi}}\mu\Big)^2+2\Big(X_0^j+\sqrt{\tfrac{\sigma^2}{2\phi}}(X_0^j-\mu)\Big)\Big(X_0^i+\sqrt{\tfrac{\sigma^2}{2\phi}}(X_0^i-\mu)\Big)$$
$$-\Big(P_0^S+\Lambda_1^S\Big(\sqrt{\tfrac{\sigma^2}{2\phi}}(X_0^i-\mu)+\sigma Z_1\Big)\Big)\sqrt{\tfrac{\sigma^2}{2\phi}}(X_0^i-\mu)\Bigg].$$

Opening up the expectation, the first line simplifies to $\frac{1}{2}\left(\mu^2+\frac{(\sigma+\sqrt{2\phi})^2}{2}\right)+\mu^2$, while the second line simplifies to $-\frac{\sigma(\sigma+\sqrt{2\phi})}{4}$, for a total expected payoff of

$$\frac{1}{2}\left[3\mu^2+\phi+\frac{\sigma\sqrt{2\phi}}{2}\right]. \tag{A43}$$

Subtracting (A43) from (A42) yields $\frac{1}{2}\left(1-\frac{\sqrt{2}}{2}\right)\sigma\sqrt{\phi}$, which is strictly positive. Therefore, both players unambiguously prefer the sequential-move game when $\rho = 0$.

The same comparison extends to $|\rho| > 0$ sufficiently small by continuity. Specifically, Proposition A4 and the results above establish existence and uniqueness for small $|\rho|$ when moves are sequential. Importantly, for such $|\rho|$, the corresponding coefficients α_L and α_F are continuous in ρ at $\rho = 0$ by Corollary A1. Likewise, for the simultaneous-move case, the equilibrium trading coefficients are independent of ρ as shown earlier, and hence trivially continuous in the same variable.

Equipped with this, we refer the reader to the Mathematica file LeaderFollowerActivism.nb in the replication package for the actual functional form of the players' payoffs in each case (sequential and simultaneous) when $\rho \neq 0$. There, we show that using (A8), (A9), and (A11) to eliminate $(\beta_F, \delta_F, \delta_L)$, and then (A14) to eliminate α_F, the players' payoffs in the sequential case are continuous functions of (ρ, α_L); hence, these payoffs are continuous in ρ at $\rho = 0$. Similarly, it can be easily verified that the same continuity property is satisfied by the payoffs in the simultaneous-move (partly because the strategy coefficients themselves are independent of ρ). See Figure 4 for their continuous pattern. This concludes the proof.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Appendix S1: Internet Appendix.
Replication Code.