Stock Buybacks, Speculative Trading, and Shareholder Welfare

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April 22, 2026

Abstract

This paper studies buybacks with two informed parties: a manager and an outside speculator. Buybacks introduce two countervailing forces. A competition effect reduces speculator profits when buybacks compete against speculative trades. A dispersion effect increases speculator profits: buying undervalued shares generates gains while buying overvalued shares generates losses, widening the dispersion in per-share value across states. Sufficiently informed buybacks benefit shareholders; uninformed buybacks harm them. These effects vary with shareholders' liquidity exposures. The desirability of informed buybacks depends on the prevalence of speculation. Authorization depends on ownership, governance, and market conditions. Shareholders might welcome informed buybacks—not merely tolerate them.

JEL classification: D82, G14, G30, G35

Keywords: share repurchases, stock buyback, liquidity, informed trading, payout policy, multi-trader Kyle model

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*Chen (corresponding author), alvin.chen@hhs.se, Stockholm School of Economics Finance Department. I thank the editor, Thierry Foucault, and an anonymous referee for their feedback, which tremendously improved the paper. I thank Philip Bond, Jonathan Brogaard, Kathryn Dewenter, Drew Fudenberg, Thomas Gilbert, Marina Halac, Jarrad Harford, Zhiguo He, Chris Hrdlicka, Björn Hagströmer, Gaoshen Ju, Avi Kamara, Jon Karpoff, Jennifer Koski, Anton Lines, Paul Malatesta, Vincent Maurin, Marcus Opp, Christine Parlour, Ed Rice, Larry Schall, Florian Schulz, Andy Siegel, Stephan Siegel, Jan Starmans, Andreas Stathopoulos, Mark Westerfield, Cedric Wu, Hongda Zhong, Yao Zeng for their insightful comments. All mistakes are mine. This research has benefited from financial support from the Swedish House of Finance, the Jan Wallander and Tom Hedelius Foundation, and the Tore Browaldh Foundation.

I Introduction

Share repurchase programs have become the cornerstone of corporate payout policies, with corporations worldwide returning over $1.2 trillion via stock buybacks in 2019 alone, primarily through open-market repurchase programs (OMR).[1] An OMR gives the firm the right but not the obligation to buy back its shares in the open market.[2] Evidence suggests that managers use this discretion and their private information to execute buybacks at favorable prices (e.g., Dittmar and Field (2015), Cook, Krigman, and Leach (2004), Brockman and Chung (2001), Ikenberry, Lakonishok, and Vermaelen (2000)). Traditionally, the literature asserts that such informed buybacks hurt shareholders.[3] A recent *Wall Street Journal* article summarizes this view:

> managers who know the stock is cheap use open-market repurchases to secretly buy back shares, boosting the value of their long-term equity. Although continuing public shareholders also profit from this indirect insider trading, selling public shareholders lose by a greater amount, reducing investor returns in aggregate.[4]

Such concerns have contributed to a move towards repurchase structures with less managerial discretion, such as accelerated share repurchases (Chemmanur, Cheng, Wu, and Zhang (2022)) and 10b5-1 plans (Bonaime, Harford, and Moore (2020)).

This paper challenges the conventional wisdom—that informed buybacks inherently harm shareholders—by showing that it rests on the incomplete premise that only the manager is informed. Prior studies of buybacks and adverse selection focus on settings where the firm is the sole informed party (e.g., Barclay and Smith (1988), Oded (2005), Bond and Zhong (2016), Ku-

[1] "The Dangers of Buybacks: Mitigating Common Pitfalls," Harvard Law School Forum on Corporate Governance, October 23, 2020.

[2] Average completion rates are around 50% after one year (Stephens and Weisbach (1998)), and roughly a quarter of firms repurchase no shares within one year of authorization (Bhattacharya and Jacobsen (2016)). International completion rates tend to be even lower (Rau and Vermaelen (2002), Ikenberry et al. (2000)).

[3] For instance, Barclay and Smith (1988) argue that "the increased trading activity in the secondary market by better-informed managers...reduces the liquidity of the firm's shares, and thereby increases the firm's cost of capital and reduces its market value." See Brockman and Chung (2001), Oded (2005), Fried (2013), Sloan and You (2015), Warusawitharana and Whited (2016), Babenko, Tserlukevich, and Wan (2020), DeLisle, Morscheck, and Nofsinger (2020) for similar arguments.

[4] "The Real Problem With Stock Buybacks." *The Wall Street Journal*, July 6, 2018.

mar, Langberg, and Oded (2017), and Bond, Yuan, and Zhong (2025)). In practice, firms compete against other parties—hedge funds, proprietary traders, informed institutions—for trading profits.[5] In this richer setting, the effects of buybacks depend critically on how they are executed. Buybacks that reflect the manager's private information compete against outside speculators, reducing their trading profits. But buybacks also affect the firm's per-share value: buying undervalued shares generates gains while buying overvalued shares generates losses, amplifying the sensitivity of per-share value to fundamentals and making speculators' private information more valuable for trading. Sufficiently informed buybacks benefit shareholders in aggregate because the competitive discipline dominates; uninformed buybacks harm them because they provide no competitive discipline while amplifying the value of speculators' information. This analysis suggests that the recent shift toward mechanical buyback execution, intended to protect shareholders from informed insider trading, may have unintended negative consequences.

I formalize this argument in a trading model featuring a manager who executes buybacks on behalf of the firm, an outside speculator who trades for personal profit, and shareholders whose unpredictable liquidity needs create noise in the market. At $t = 0$, the firm can authorize a buyback program. At $t = 1$, both the manager and the speculator observe private signals about the firm's fundamentals. The manager decides whether to execute the authorized buyback; the speculator decides whether to buy. Competitive Kyle (1985)-type market makers observe aggregate order flow and set prices. At $t = 2$, the firm's fundamentals become public, and accounts are settled.

In my framework, the *informativeness* of buybacks refers to the extent to which their execution tracks the manager's private information. For instance, when the manager buys back shares only when she knows fundamentals are high, buybacks are fully informed. When she buys regardless of what she knows, buybacks are uninformed.

Buybacks introduce two countervailing forces. The first is a *competition effect*. When the manager executes buybacks in an informed way, her trades make the aggregate order flow more informative about firm fundamentals. The resulting improvement in price discovery compresses the

[5] Evidence suggests that the firm competes against other informed parties over the spoils of private information (see Ben-David and Roulstone (2005), Dittmar and Field (2015), Chemmanur, Li, and Zhu (2016)).

speculator's trading profits—he can no longer buy undervalued shares as cheaply. The competition effect is a classic feature of models with multiple informed traders, but prior buyback research overlooks it by assuming only the manager is informed.[6]

The second is a *dispersion effect*. Unlike the speculator's trades, buybacks affect the firm's per-share value. In good states, when fundamentals are high, the buyback of undervalued shares generates trading gains that increase the firm's per-share value. In bad states, when fundamentals are low, the buyback of overvalued shares incurs trading losses that decrease per-share value. These state-dependent gains and losses increase the dispersion of the firm's per-share value across different realizations of its fundamentals—higher in good states, lower in bad states. The increased sensitivity of the firm's per-share value to its fundamentals makes the speculator's private information more valuable for trading.

Less informed buybacks weaken the competition effect—order flow becomes less revealing when buybacks occur even when fundamentals are low—while strengthening the dispersion effect: they are more likely to occur in bad states, generating trading losses that push per-share value further below fundamentals. I show that buybacks reduce the speculator's trading profits—and thereby benefit shareholders in aggregate—if and only if they are sufficiently informed. Uninformed buybacks unambiguously harm shareholders: they provide no competitive discipline against the speculator while maximizing the value dispersion that makes speculative trading profitable. This result offers a new perspective on the idea that buybacks stabilize markets, with firms acting as "buyers of last resort" (Hong, Wang, and Yu (2008)). While uninformed buybacks can support the firm's short-term stock price, the trading losses they generate when fundamentals are weak further depress the firm's per-share value once fundamentals become known.

Whether buybacks are, in fact, informed is an equilibrium outcome. As is common in applied models of corporate decision-making (e.g., Stein (1989), Holmstrom and Tirole (1993)), the manager maximizes a weighted combination of the firm's interim stock price and long-term

[6] Buffa and Nicodano (2008) also consider the interaction between informed buybacks and speculative trading, but model informed trading in a reduced form—the stock price does not reflect the right to buyback profits—abstracting from how buybacks endogenously affect the per-share value of the firm.

value—reflecting, for instance, compensation contracts tied to both short- and long-term performance. The manager's equilibrium strategy depends on her incentives. A manager focused on long-term value executes informed buybacks, while a manager concerned with short-term price performance may buy back overvalued shares to inflate the interim price. Beyond managerial incentives, constraints on informativeness can also arise from legitimate corporate objectives—such as offsetting dilution from equity compensation or distributing excess cash—that push toward consistent execution regardless of fundamentals.

While the aggregate effects of buybacks depend on informativeness, they mask important heterogeneity across shareholders. I distinguish shareholders by their exposure to liquidity shocks. *Liquidity-insulated* shareholders—insiders, blockholders, and long-horizon institutions—hold until firm fundamentals are revealed. They benefit from informed buybacks because they capture buyback gains without bearing adverse selection costs, a phenomenon that Fried (2013) refers to as "insider trading via the firm." In contrast, *liquidity-exposed* shareholders—those who may need to sell before fundamentals are revealed—face a tradeoff. Informed buybacks transfer wealth to liquidity-insulated shareholders but also reduce the profits the speculator earns at their expense. Which effect dominates depends on the prevalence of informed speculation. When speculation is rare, they prefer less-informed buybacks, recovering the standard argument against informed buybacks in the prior literature (e.g., Barclay and Smith (1988)). When speculation is prevalent, liquidity-exposed shareholders benefit from informed buybacks. This result is consistent with findings from Hillert, Maug, and Obernberger (2016), who show that more informed buybacks can improve rather than harm liquidity.

The authorization decision, therefore, depends on ownership composition and governance. When insiders control the board, they always authorize buybacks. When liquidity-exposed shareholders have influence, they oppose buybacks when informed speculation is rare, but support authorization when speculation is prevalent and they anticipate sufficiently informed execution.

This analysis helps explain documented patterns. Buyback authorizations are procyclical (e.g., Jagannathan, Stephens, and Weisbach (2000), Dittmar and Dittmar (2008)) and more common for firms with liquid shares (e.g., Brockman, Howe, and Mortal (2008)). The model rationalizes both patterns: conditions of strong expected fundamentals and high liquidity increase the anticipated informativeness of buyback execution, making authorization more attractive to liquidity-exposed shareholders.

The framework also illuminates payout policy. The literature highlights several advantages of buybacks over dividends—such as tax efficiency (Grullon and Michaely (2002)), the ability to adjust payout without signaling negative information (Jagannathan et al. (2000)), and usefulness in offsetting dilution from equity compensation (Kahle (2002))—that are maximized by consistent execution regardless of fundamentals. Such uninformed execution generates the dispersion effect that harms liquidity-exposed shareholders. Dividends, by contrast, reduce per-share value equally in good and bad states—the firm has less cash regardless of fundamentals—creating no dispersion effect. This distinction presents a trade-off: firms seeking to maximize the benefits of buybacks must execute consistently, but consistent execution is uninformed execution, which amplifies the profitability of informed speculation at the expense of liquidity-exposed shareholders. The secular shift from dividends to buybacks (e.g., Kahle and Stulz (2021)) may therefore have distributional consequences for shareholders with different liquidity exposures, beyond the tax and flexibility considerations typically emphasized in the literature.

Related Literature. This paper connects to several strands of literature. One strand examines open-market repurchases as a payout policy. Researchers have proposed many explanations for the popularity of these programs, including tax advantages (Grullon and Michaely (2002), Moser (2007)), financial flexibility (Stephens and Weisbach (1998), Guay and Harford (2000), Jagannathan et al. (2000), Bonaime, Hankins, and Harford (2013)), mitigation of agency conflicts (Oded (2011), Caton, Goh, Lee, and Linn (2016), and signaling (Oded (2005), Bhattacharya and Jacobsen (2016)). See Bonaime and Kahle (2024) for a recent comprehensive survey.

Since Barclay and Smith (1988), the notion that informed buybacks impose adverse selection costs has played an important role in this literature. This view arises naturally when the manager is the sole informed party: her buyback trades profit at the expense of less informed shareholders (e.g., Fried (2013), Babenko et al. (2020)). Prior work views informed buybacks as a cost that shareholders reluctantly accept to access other benefits of repurchase programs. My framework suggests that shareholders might welcome informed buybacks—not merely tolerate them—because they provide competitive discipline against outside speculators. This paper also complements recent theoretical analyses that study buybacks in richer environments, though still featuring only one informed party. Bond and Zhong (2016) investigate dynamic tender-offer buybacks under persistent asymmetric information. Bond et al. (2025) develop a unified signaling framework for share issues and buybacks that explains the asymmetry in transaction methods. Campello, Matta, and Saffi (2025) examine how buybacks interact with manipulation incentives and short-selling frictions when prices affect real investment.

Another strand is the literature on the real effects of financial markets (Dow and Gorton (1997); see Bond, Edmans, and Goldstein (2012) for a survey), which emphasizes how prices affect firm value by guiding investment decisions. Here, buybacks affect per-share value directly through trading gains and losses. Because buybacks alter the profitability of informed trading, they can interact with feedback effects in settings where prices guide real decisions.

Finally, my analysis relates to the literature that investigates trading in Kyle (1985)-type frameworks with multiple informed parties. Research consistently finds that additional informed traders decrease existing speculators' profits (e.g., Admati and Pfleiderer (1988), Holden and Subrahmanyam (1992), Back, Cao, and Willard (2000)).[7] This competition effect completely characterizes how additional informed parties affect trading dynamics in conventional trading models. My analysis reveals that buybacks generate a dispersion effect absent from standard informed trading—one that can dominate the competition effect when buybacks are uninformed—demonstrating that buybacks by the firm differ from informed trading by outside speculators in important ways.

[7] One notable exception is Subrahmanyam and Titman (1999), where the addition of a differently informed party can increase existing speculators' profits through a mechanism distinct from the dispersion effect.

II The Model

The model spans three dates ($t = 0, t = 1, t = 2$) and features risk-neutral economic agents: the firm's shareholders, a manager who executes buybacks on behalf of the firm, an outside speculator who trades for personal profit, and market makers who clear the market. The firm has assets in place that generate a payoff of A at $t = 2$ that can be high ($A = 1$) or low ($A = 0$) with probabilities θ and $1-\theta$, respectively. The parameter $\theta \in (0,1)$—the probability that firm fundamentals are high—captures the firm's ex-ante quality. The firm is financed entirely by equity and has one share outstanding at $t = 0$.

At $t = 0$, the firm's shareholders can authorize a buyback program.[8] If authorized, the program gives the manager the discretion to buy back $x < 1-\theta$ shares on behalf of the firm at $t = 1$. The parameter restriction on x ensures that there is a unique equilibrium trading strategy for the manager.[9] Let $k = \frac{x}{1-x}$ denote the scale of the buyback program, measuring shares repurchased relative to shares remaining. If shareholders do not authorize a buyback program at $t = 0$, the manager cannot buy back shares at $t = 1$. In contrast with conventional signaling models of stock buybacks, the authorization at $t = 0$ conveys no information about the firm's fundamentals because it takes place before insiders (e.g., the manager) receive private information, consistent with empirical evidence and institutional practice.[10]

Trading at $t = 1$ takes place in a market characterized by a discrete-trade version of the Kyle (1985) framework, in which participants trade in increments of x shares. Shareholders who experience liquidity needs at $t = 1$ submit an order of q_Z shares, with q_Z taking values $-x$ and 0 with equal probability. These liquidity-driven trades are independent of firm fundamentals (A).

[8] Open-market repurchases are typically implemented through board-authorized programs that specify terms such as the number of shares and maximum dollar amount, while leaving the timing and execution to management's discretion. Firms often conduct buybacks within the SEC's Rule 10b-18 safe harbor, which imposes certain conditions on the manner, timing, price, and volume. Some firms use pre-arranged plans under Rule 10b5-1 that commit to a schedule of buybacks, effectively removing managerial discretion over execution. Section V analyzes how ownership composition and governance structure affect the authorization decision.

[9] See the proof of Proposition 4 for more details.

[10] For instance, Grullon and Michaely (2002) find no evidence of future operational improvements, such as profitability, for buyback announcing firms (see also Jagannathan and Stephens (2003)). U.S. securities law prohibits firms from announcing buyback programs while in possession of material non-public information.

Before trading begins at $t = 1$, the speculator observes the realized value of fundamentals with probability $\phi \in (0,1)$, capturing the notion that speculators are imperfectly informed. The speculator's trading strategy specifies an order $q_S \in \{0,x\}$ that depends on his private information about firm fundamentals.[11] He trades to maximize his expected trading profits.

Prior to trading, the manager perfectly observes the realized value of fundamentals. The manager's buyback strategy specifies the probability with which she executes the buyback program—defined as submitting a buy order of $q_B = x$—conditional on her private information about firm fundamentals. The manager executes buybacks to maximize $\mathbb{E}[\omega P + V]$, where P is the firm's stock price at $t = 1$, V is the firm's per-share value at $t = 2$, and $\omega \geq 0$ captures her concern for the interim stock price. For instance, the manager may have a linear compensation contract that increases with the firm's stock price at $t = 1$ and $t = 2$ as in Holmstrom and Tirole (1993).[12] Insider trading restrictions prevent the manager from trading using her personal account at $t = 1$.

Deep-pocketed market makers observe the aggregate order flow $q = q_B + q_S + q_Z$. Competition among many market makers implies that they set prices to break even in expectation. For brevity, I refer to market makers collectively as the market.

At $t = 2$, the fundamentals of the firm become public information. The market makers settle accounts. The firm is liquidated, with proceeds distributed pro rata to holders of its outstanding shares.[13] Table 1 summarizes the timing of the model.

The trading equilibrium at $t = 1$ consists of three components: a pricing rule, the speculator's trading strategy, and the manager's buyback strategy. In equilibrium, the market sets prices equal to the firm's expected per-share value at $t = 2$ conditional on aggregate order flow and the

[11] For simplicity, the baseline model assumes the speculator cannot short sell. Appendix C.B extends the analysis to incorporate short selling by allowing the speculator to submit an order $q_S \in \{-x,0,x\}$. The economic forces that govern the speculator's buying profits also govern his shorting profits. Informed buybacks make order flow more revealing, lowering the expected price in bad states and compressing the speculator's shorting profits. Buyback trading losses push per-share value below fundamentals, making it cheaper to cover the short and amplifying his shorting profits. These countervailing forces mirror those in the baseline analysis.

[12] See also Ofer and Thakor (1987) who study tender offer repurchases by a manager concerned with both the firm's long-run value and its short-term stock price and model the objective function in a similar way.

[13] When the order imbalance is positive, market makers borrow shares from existing shareholders to clear the market, including delivery to the firm for cancellation. At $t = 2$, when firm fundamentals are revealed, market makers purchase shares at the realized per-share value and return them to the lending shareholders.

Table 1: Summary of Model Timing

t=0	Firm authorizes a buyback program or not
t=1	The manager and the speculator receive their private information. The manager, speculator, and shareholders with liquidity needs simultaneously submit orders Competitive market makers (the market) set a price based on aggregate order flow and clear the market
t=2	The firm's fundamentals become public information Accounts are settled The firm is liquidated, and proceeds are distributed pro rata to holders of its outstanding shares

anticipated strategies of the other parties. The speculator chooses his trading strategy to maximize expected profits given the pricing rule, the manager's strategy, and his private information. The manager selects her buyback strategy to maximize a weighted combination of the firm's stock price at $t = 1$ and per-share value at $t = 2$, given the pricing rule, the speculator's strategy, and her private information.

III Buybacks and Trading Outcomes

This section analyzes how a stock buyback program affects trading outcomes at $t = 1$. I begin by characterizing the benchmark trading equilibrium without buybacks (denoted with subscript 0).

Lemma 1. *In the absence of a buyback program, the equilibrium pricing rule is*

$$P_0(q) = \begin{cases} \frac{\theta(1-\phi)}{\theta(1-\phi)+(1-\theta)} & \text{if } q = -x, \\ \theta & \text{if } q = 0, \\ 1 & \text{if } q = x, \end{cases} \tag{1}$$

and the speculator buys x shares if and only if he learns that firm fundamentals are high ($A = 1$).

The results of Lemma 1 follow the standard logic of Kyle-type informed trading frameworks. The presence of noise trading implies that the expected market-clearing price is strictly between 0 and 1 both when $A = 1$ and $A = 0$. Hence, the speculator strictly prefers to buy upon learning $A = 1$ and to abstain otherwise. The market makers' equilibrium pricing rule reflects this trading strategy, increasing with the aggregate order flow.

Lemma 1 implies that the speculator's expected trading profit (Π) in this benchmark is

$$\Pi_0 = \tfrac{1}{2} x \phi \theta (1 - \theta). \tag{2}$$

As is standard in such informed trading frameworks, the speculator's expected trading profits increase with his private information (ϕ), the volatility of the firm's fundamentals ($\theta(1-\theta)$), and the volatility of noise trade (x). More uncertainty about fundamentals amplifies potential mispricing and, in turn, trading profits. Additional noise trade allows him to take larger positions without revealing his information.

III.A Trading Equilibrium with Buybacks

This section analyzes the implications of a buyback program on trading outcomes. The authorization of a buyback program at $t = 0$ makes the firm an active participant in the market for its shares, with the manager effectively becoming another informed trader at $t = 1$. In this section, I assume that the manager executes buybacks with probability $b_1 = 1$ when firm fundamentals are high ($A = 1$) and with probability $b_0 \in [0, 1]$ when fundamentals are low ($A = 0$). Section IV shows that such a buyback strategy is indeed optimal for a manager who maximizes a weighted combination of the firm's stock price at $t = 1$ and per-share value at $t = 2$.[14] One interpretation of the buyback strategy is that the manager executes a fraction b_0 of the program in an uninformed manner—buying x shares regardless of fundamentals—and the remaining fraction $1 - b_0$ in an informed manner—buying only when fundamentals are high. Under this interpretation, $1 - b_0$ measures the informativeness of buybacks. As b_0 increases, the difference in the execution probabilities in good and bad states narrows, and buybacks become less informative. Buybacks are fully

[14] Section VI.B explores how other frictions, such as liquidity constraints, may affect the manager's buyback strategy and the resulting trading equilibrium.

uninformed when $b_0 = 1$: the manager buys with the same probability in good and bad states, so buybacks carry no information about fundamentals.

A buyback program changes the trading equilibrium in important ways. The following lemma characterizes the new trading equilibrium with buybacks (denoted with subscript B).

Lemma 2. *Given a stock buyback program and the manager's buyback execution strategy* $(b_1 = 1, b_0)$*, the equilibrium pricing rule is*

$$P_B(q) = \begin{cases} 0 & \text{if } q = -x, \\ \frac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)} & \text{if } q = 0, \\ \frac{\theta}{\theta+(1-\theta)b_0} & \text{if } q = x, \\ 1 & \text{if } q = 2x, \end{cases} \tag{3}$$

and the speculator buys x shares if and only if he learns that firm fundamentals are high ($A = 1$)*.*[15]

A stock buyback program introduces two economic forces to trading at $t = 1$. First, it affects the market's inferences about firm fundamentals by altering the information content of the order flow. An informed execution of buybacks makes the order flow more revealing, improving price discovery and lowering informed trading profits. This *competition effect* is a robust feature of trading frameworks with many informed parties. Second, it generates buyback profits and losses that make the firm's per-share value more sensitive to its fundamentals. This *dispersion effect* is unique to the buyback setting.

III.A.1 Competition Effect

A buyback program introduces the firm's manager as an additional informed trader who may execute buybacks in ways that affect the informativeness of the order flow. To see this clearly,

[15] The price $P_B(-x) = 0$ reflects full revelation of the bad state. Because the manager always executes buybacks when fundamentals are high in the baseline model ($b_1 = 1$), the minimum order flow in the good state is $q = 0$, so an order flow of $q = -x$ can only arise in the bad state. Moreover, $q = -x$ implies that no buyback was executed, so no trading losses are incurred, and per-share value equals the fundamental payoff ($A = 0$). When the manager does not always buy in the good state, $P_B(-x) > 0$ (See Section VI.B).

consider how the market updates its beliefs about the firm's fundamentals (A) based on the observed order flow (q): $\hat{\theta}(q) = Pr(A = 1|q)$. In the benchmark without buybacks, the market's posterior belief is

$$\hat{\theta}_0(q) = \begin{cases} \frac{\theta(1-\phi)}{\theta(1-\phi)+(1-\theta)} & \text{if } q = -x, \\ \theta & \text{if } q = 0 \\ 1 & \text{if } q = x. \end{cases} \tag{4}$$

With buybacks, the market's posterior belief becomes

$$\hat{\theta}_B(q) = \begin{cases} 0 & \text{if } q = -x, \\ \frac{\theta(1-\phi)}{\theta(1-\phi)+(1-\theta)} & \text{if } q = 0, \\ \frac{\theta}{\theta+(1-\theta)b_0} & \text{if } q = x, \\ 1 & \text{if } q = 2x. \end{cases} \tag{5}$$

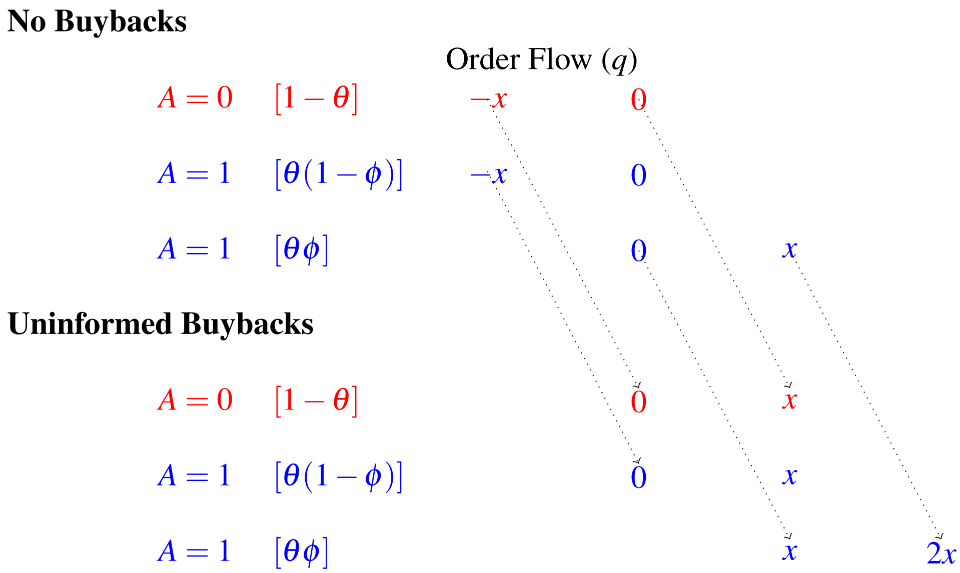
One measure of market informativeness is the difference between the market's expected posterior belief in the two fundamental states: $\Delta\hat{\theta} = \mathbb{E}[\hat{\theta}|A = 1] - \mathbb{E}[\hat{\theta}|A = 0]$. A larger $\Delta\hat{\theta}$ indicates that the order flow better discriminates between high ($A = 1$) and low fundamentals ($A = 0$), with $\Delta\hat{\theta} = 1$ corresponding to the case where the market perfectly infers the firm's fundamentals from the order flow. Comparing (4) and (5) yields the following result.

Lemma 3. *Relative to the benchmark, a buyback program improves market informativeness ($\Delta\hat{\theta}_B > \Delta\hat{\theta}_0$) if buybacks are informed ($b_0 < 1$). The improvement increases with buyback informativeness.*

When buybacks are uninformed ($b_0 = 1$), they simply shift the distribution of the order flow—increasing it by x—across all fundamental states, as shown in Figure 1. This shift does not affect the information content of the order flow, leaving market informativeness unchanged ($\Delta\hat{\theta}_B = \Delta\hat{\theta}_0$).

In contrast, informed buybacks ($1 - b_0 > 0$) make the order flow more revealing of firm fundamentals. As illustrated in Figure 2, informed buybacks are more likely to shift the order flow

Figure 1: Distribution of Order Flow: No Buybacks vs. Uninformed Buybacks.
The top panel shows the distribution of the order flow (q) across different firm fundamentals (A) in the absence of a buyback program. The bottom panel shows how uninformed buybacks ($1 - b_0 = 0$) shift the distribution of the order flow to the right by x units in all states, leaving the informativeness of the order flow unchanged.



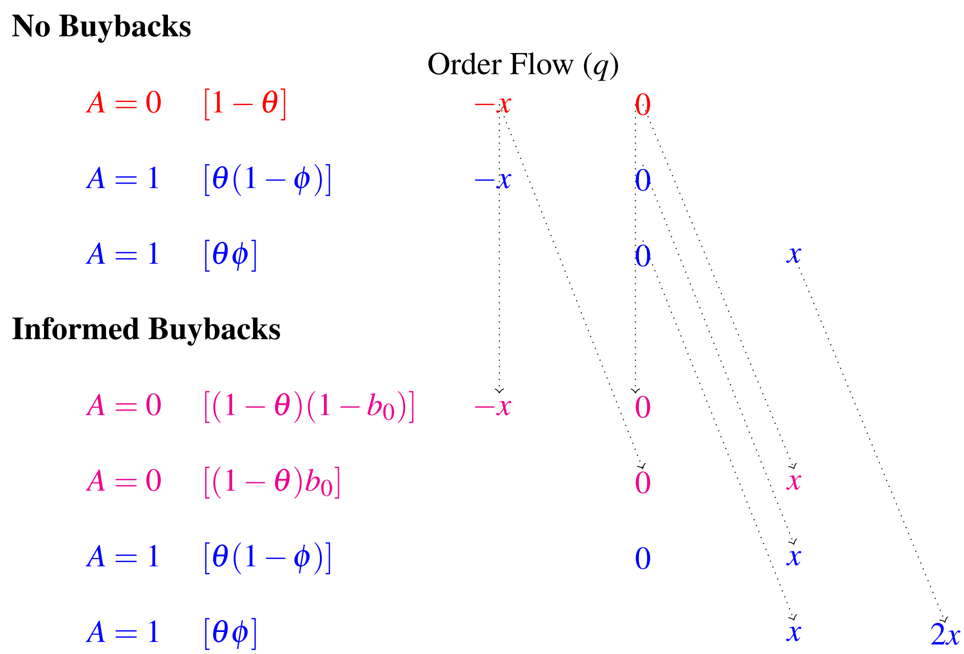
distribution rightward when firm fundamentals are high ($A = 1$) than when they are low ($A = 0$). This state-contingent shift makes high order flows more indicative of high fundamentals, and low order flows more indicative of low fundamentals. The more informative the buybacks (i.e., higher $1 - b_0$), the greater the improvement in market informativeness.

Informed buybacks that closely track the firm's fundamentals erode the speculator's informational advantage by making the order flow more revealing. In other words, informed buybacks compete against the speculator's informed trades.

These results parallel the classic literature on competing informed traders (e.g., Admati and Pfleiderer (1988), Holden and Subrahmanyam (1992), Foster and Viswanathan (1993), Back et al. (2000)), where additional informed parties enhance price informativeness and compress existing traders' profits. However, a crucial distinction emerges: in conventional models, informed traders use private accounts and personally bear their trading gains and losses. While their activities alter the firm's ownership composition, they do not directly affect per-share value.[16] Consequently, the

[16]Financial feedback models are exceptions (see Bond et al. (2012) for a survey). For example, in Goldstein and

Figure 2: Distribution of Order Flow: No Buybacks vs. Informed Buybacks.
The top panel shows the distribution of the order flow (q) across different firm fundamentals (A) in the absence of buybacks. The bottom panel illustrates how informed buybacks improve the informativeness of the order flow by shifting the distribution of the order flow to the right more when the firm's fundamentals are high ($A = 1$) than when they are low ($A = 0$).



competition effect completely captures the impact of introducing an additional informed trader.

In my framework, however, the additional informed trader is the manager acting on behalf of the firm. Her buyback trades affect not only the information content of order flow but also the distribution of per-share value through realized trading gains and losses—introducing the novel *dispersion effect* analyzed next.

III.A.2 Dispersion Effect

Buyback activity generates trading gains and losses that accrue to the firm's remaining shareholders. Consequently, with buybacks, the firm's per-share value at $t = 2$ becomes $V = A + T$, where A represents the fundamental payoff from the firm's assets and T captures the per-share gains and losses from the firm's trading activity.

Guembel (2008), misinformation in prices induces suboptimal investment decisions that lower firm value. In contrast, my framework features no investment decisions and focuses on a different mechanism: changes in per-share value stemming from the realized trading profits and losses of buyback activity.

The impact of buybacks on the firm's per-share value at $t = 2$ depends on whether its shares are under- or overvalued at $t = 1$. When fundamentals are high relative to the market-clearing price at $t = 1$ ($A > P_B$), the firm buys back undervalued shares, generating trading gains that increase per-share value at $t = 2$ from A to V_H (i.e., $T > 0$):

$$V_H = \frac{\overbrace{A}^{\text{fundamentals}} - \overbrace{xP_B}^{\text{cost of buybacks}}}{\underbrace{1-x}_{\text{remaining shares}}} = A + \underbrace{k(A-P_B)}_{\text{buyback trading gain } (T_G)} > A, \tag{6}$$

where $k = \frac{x}{1-x}$ is the scale of the buyback program. Conversely, when fundamentals are low relative to the market-clearing price at $t = 1$ ($A < P_B$), the firm buys back overvalued shares, generating trading losses that decrease per-share value at $t = 2$ from A to V_L (i.e., $T < 0$):

$$V_L = \frac{\overbrace{A}^{\text{fundamentals}} - \overbrace{xP_B}^{\text{cost of buybacks}}}{\underbrace{1-x}_{\text{remaining shares}}} = A - \underbrace{k(P_B-A)}_{\text{buyback trading loss } (T_L)} < A. \tag{7}$$

Unlike the trades of speculators, buybacks tend to increase the firm's per-share value when its fundamentals are high ($A = 1$) and decrease the firm's per-share value when its fundamentals are low ($A = 0$). As a result, buybacks amplify the sensitivity of the firm's per-share value to its fundamentals—the *dispersion effect*.[17]

To quantify this effect, consider the dispersion in the firm's expected per-share value between good ($A = 1$) and bad ($A = 0$) states: $\Delta V = E[V|A = 1] - E[V|A = 0]$. In the benchmark without buybacks, this measure simply equals the fundamental spread in asset payoffs: $\Delta V_0 = 1$. With buybacks, the dispersion becomes

$$\Delta V_B = \big(1 + \underbrace{\mathbb{E}[T|A=1]}_{=\bar{T}_G \geq 0}\big) - \big(0 + \underbrace{\mathbb{E}[T|A=0]}_{=-b_0\bar{T}_L \leq 0}\big) = \Delta V_0 + \bar{T}_G + b_0\bar{T}_L, \tag{8}$$

[17]The dispersion effect persists even if the firm can sell overvalued shares (e.g., through shelf registration), as long as trading profits per share are higher in good states than bad states—which likely holds because the firm's informed buying concentrates profits while its informed selling dilutes them.

where $\bar{T}_G$ and $\bar{T}_L$ are the magnitudes of the expected trading gains and losses from executing buybacks when the firm's fundamentals are high ($A = 1$) and low ($A = 0$), respectively.

Lemma 4. *Relative to the benchmark, a buyback program strictly increases the dispersion of the firm's per-share value ($\Delta V_B > \Delta V_0$). The dispersion in per-share value decreases with the informativeness of buybacks ($\frac{\partial \Delta V_B}{\partial b_0} > 0$).*

Buybacks increase the dispersion of the firm's per-share value: they tend to raise per-share value when fundamentals are high and reduce it when fundamentals are low. Less informed buybacks amplify value dispersion through two channels. First, they incur larger trading losses in bad states ($A = 0$), further suppressing value. Second, they make the order flow less informative, which increases the profitability of good-state buybacks, further boosting value in good states ($A = 1$).

The competition effect of buybacks improves market informativeness and reduces information asymmetry about the firm's fundamentals among market participants. The dispersion effect works in the opposite direction—the increased sensitivity of the firm's per-share value to its fundamentals makes any residual private information more valuable for trading. These changes have important economic consequences, as they determine both the efficiency of market prices and the distribution of trading gains between the speculator and the firm's shareholders.

III.B Speculator's Profits

This section explores how buybacks shape trading outcomes, focusing on the speculator's expected trading profits. Because these gains come at the expense of shareholders with liquidity needs, they are essential for evaluating how buybacks affect shareholder welfare.

To begin, consider the following measure of price discovery: $\Delta P = \mathbb{E}[P|A = 1] - \mathbb{E}[P|A = 0]$. It captures how much market prices differ across fundamental states, with higher values indicating that prices better reflect the firm's underlying value. In the benchmark without buybacks, price discovery coincides with market informativeness because the firm's per-share value only depends on the fundamental payoff of its assets (A): $\Delta P_0 = \Delta\hat{\theta}_0$. With buybacks, price discovery involves learning both about fundamentals and buyback trading gains, which are jointly determined.

Lemma 5. *Price discovery improves with the informativeness of buybacks* ($\frac{\partial \Delta P_B}{\partial b_0} < 0$).

At first glance, this result may seem puzzling. The analysis in Section III.A.2 shows that less informed buybacks generate more dispersion in per-share value, suggesting that prices should also diverge more across fundamental states. However, price discovery depends not only on the actual dispersion of per-share value, but also on what the market can infer from the order flow. Section III.A.1 shows that less informed buybacks decrease the information content of the order flow. This effect dominates, and a more informed execution of buybacks improves price discovery.

Recall that q_S denotes the speculator's order. His expected trading profit can be expressed as

$$\Pi = \mathbb{E}[q_S(V-P)] = Cov(q_S, V-P) - \mathbb{E}[q_S]\mathbb{E}[V-P] = Cov(q_S, V-P), \tag{9}$$

where the last equality follows from the market-clearing condition ($\mathbb{E}[V-P] = 0$). The speculator profits to the extent that his trades covary positively with the deviation of per-share value from price—that is, he gains by buying when the firm's shares are undervalued and abstaining when they are overvalued.

To build intuition, consider the limiting case with $\phi \to 1$, where the speculator is almost always informed. Recall that the speculator buys ($q_S = x$) if and only if he learns that firm fundamentals are high ($A = 1$). In this case, the speculator almost always observes fundamentals, so his order (q_S) is nearly perfectly correlated with A, implying that

$$\Pi = \mathbb{E}[q_S(V-P)] = xCov(A, V-P) = x\theta(1-\theta)\big(\Delta V - \Delta P\big). \tag{10}$$

and

$$\Pi_B - \Pi_0 = x\theta(1-\theta)\big[\big(\Delta V_B - \Delta V_0\big) - \big(\Delta P_B - \Delta P_0\big)\big]. \tag{11}$$

This decomposition (11) reveals the tension between the two effects of buybacks. The competition effect improves price discovery ($\Delta P_B > \Delta P_0$), compressing the speculator's informational advantage. The dispersion effect increases the spread in per-share value across fundamental states ($\Delta V_B > \Delta V_0$), making his private information about firm fundamentals more valuable for trading. Buybacks reduce the speculator's expected trading profit relative to the benchmark if and only if the competition effect dominates the dispersion effect.

In the more general case with $\phi \in (0,1)$, the speculator is not always informed. As a result, his trades are not perfectly correlated with firm fundamentals, and the expression for his expected trading profit does not decompose cleanly into value dispersion and price discovery components. Intuitively, what matters is how value and prices vary across the speculator's trading decisions, not just across fundamental states. Nevertheless, the same economic forces apply: the dispersion effect raises the stakes for informed trading, while the competition effect erodes the speculator's informational advantage. The following proposition formalizes these results.

Proposition 1. *Relative to the benchmark, a buyback program strictly decreases the speculator's expected trading profit if and only if buybacks are sufficiently informed: there exists a threshold* $\bar{b}_0 \in (0,1)$ *such that* $\Pi_B < \Pi_0 \Leftrightarrow b_0 < \bar{b}_0$.

An immediate implication of Proposition 1 is that uninformed buybacks ($b_0 = 1$) unambiguously increase the speculator's expected trading profits. Uninformed buybacks maximize the dispersion effect while contributing nothing to the competition effect. The speculator benefits from the increased value dispersion without facing any additional competition for trading profits.

The results in this section characterize how buybacks affect the speculator's expected trading profits, which, in turn, reveal how they affect the aggregate payoffs of the firm's existing shareholders. For this analysis, the level of informed speculation (ϕ) affects the magnitude of changes but not the qualitative conclusions. However, when analyzing how buybacks affect different types of shareholders, the level of informed speculation becomes qualitatively important as well. Section III.C explores these welfare implications.

III.C Heterogeneous Shareholder Welfare

A central concern in the literature is that informed buybacks transfer wealth from outside shareholders to insiders—a phenomenon Fried (2013) calls "insider trading via the firm" (see also Barclay and Smith (1988), Fried (2005), Buffa and Nicodano (2008), Babenko et al. (2020) for similar arguments). The mechanism underlying this wealth transfer is not insider status per se, but rather that insiders typically hold their shares until firm value is realized, whereas outside shareholders may need to sell beforehand to satisfy liquidity needs. Hence, this section examines how a buyback program affects shareholders with different exposures to liquidity shocks.

So far, the analysis has been agnostic about how the firm's ownership is structured. To connect to the literature on wealth transfers between insiders and outside shareholders, I consider two types of investors who initially own the firm: liquidity-exposed and liquidity-insulated, denoted with superscript E and I, respectively. Liquidity-exposed shareholders own a fraction x of the firm; their liquidity needs at $t = 1$ are the source of noise trade in the model.[18] Liquidity-insulated shareholders own the remaining $1 - x$ shares and hold their position until $t = 2$. These two groups represent the extremes of liquidity exposure. The payoffs of shareholders with intermediate exposures can be obtained as convex combinations of the two, providing insight into heterogeneous welfare effects—including for insiders and outside shareholders as conventionally defined.

In the benchmark, the firm's expected per-share value at $t = 2$ equals θ, the expected fundamental payoff of its assets. The expected payoff of liquidity-insulated shareholders is $U_0^I = (1 - x)\theta$. The expected payoff of liquidity-exposed shareholders is $U_0^E = x\theta - \Pi_0$. Because of their liquidity needs at $t = 1$, the speculator's trading profits come at their expense.

With buybacks, the firm's expected per-share value at $t = 2$ becomes $\theta + \mathbb{E}[T]$, where $\mathbb{E}[T]$ is the expected per-share trading gains of its buyback program. The expected payoff of liquidity-insulated shareholders becomes $U_B^I = (1 - x)(\theta + \mathbb{E}[T])$.

Lemma 6. *The expected per-share trading gain of the buyback program is positive ($\mathbb{E}[T] \geq 0$) and*

[18] Allowing liquidity-exposed shareholders to short-sell does not alter the analysis. Shorting against an existing long position is payoff-equivalent to selling shares and therefore does not preserve the shareholder's net economic exposure to the firm's terminal per-share value.

increases with the informativeness of buybacks ($\frac{\partial \mathbb{E}[T]}{\partial b_0} < 0$).

An informed manager who executes buybacks based on her private information about firm fundamentals earns trading profits in expectation: she is more likely to buy back shares when they are undervalued than when they are overvalued. The more buybacks reflect the manager's private information, the larger the expected profits from buybacks.

Because the firm's liquidity-insulated shareholders hold their shares until $t = 2$, they avoid adverse selection trading costs at $t = 1$. Instead, they benefit from the trading gains generated by informed buybacks. Lemma 6 therefore implies that liquidity-insulated shareholders are always weakly better off with a buyback program, strictly so if buybacks are informed ($b_0 < 1$). This result echoes a concern emphasized by Barclay and Smith (1988) and others in the literature: informed buybacks benefit those who hold their shares until firm fundamentals are revealed at the expense of those who may need to sell earlier. This traditional perspective implies that liquidity-exposed shareholders prefer less informed buybacks to limit this wealth transfer. Whether this conclusion holds, however, depends on the prevalence of informed speculation (ϕ) in the market.

To see why, note that buybacks present a more complex trade-off for liquidity-exposed shareholders because they affect two wealth transfers: one to liquidity-insulated shareholders and another to the speculator. With buybacks, the expected payoff of liquidity-exposed shareholders is

$$U_B^E = \underbrace{x\theta}_{\text{fundamental payoff}} - \underbrace{(1-x)\mathbb{E}[T]}_{\text{transfer to liquidity-insulated shareholders}} - \underbrace{\Pi_B}_{\text{transfer to speculator}}. \tag{12}$$

The first term ($x\theta$) is the fundamental value of the liquidity-exposed shareholders' stake. The second term ($(1-x)\mathbb{E}[T]$) reflects a wealth transfer to liquidity-insulated shareholders, who capture a fraction of the expected buyback gains without incurring trading costs. The final term (Π_B) is the wealth transfer to the speculator, whose informed trades profit at the expense of liquidity-exposed shareholders. One can interpret the last two terms as the reduction in the expected payoff of liquidity-exposed shareholders due to illiquidity.

More informative buybacks have two opposing effects on this payoff. They increase the wealth transfer to liquidity-insulated shareholders, but also decrease the wealth transfer to the speculator. In general, the net effect is ambiguous and can be non-monotonic.

$$\frac{\partial U_B^E}{\partial b_0} = -(1-x)\underbrace{\frac{\partial \mathbb{E}[T]}{\partial b_0}}_{<0} - \underbrace{\frac{\partial \Pi_B}{\partial b_0}}_{>0} \gtreqless 0. \tag{13}$$

However, we can characterize the effects when informed speculation (ϕ) is sufficiently rare or sufficiently prevalent. When informed speculation is sufficiently rare, liquidity-exposed shareholders face limited adverse-selection trading costs in the benchmark, so the benefit of reducing the speculator's profits is small. In this case, the wealth transfer to liquidity-insulated shareholders dominates, and liquidity-exposed shareholders prefer less informative buybacks.

Proposition 2. *When informed speculation is sufficiently rare ($\phi < \underline{\phi}$), the expected payoff of liquidity-exposed shareholders decreases with the informativeness of buybacks ($\frac{\partial U_B^E}{\partial b_0} > 0$).*

This result aligns with the conventional view in the literature, which abstracts from informed speculation and concludes that liquidity-exposed shareholders prefer less informed buybacks to limit the wealth transfer to liquidity-insulated shareholders, such as insiders. Proposition 2 shows that this conclusion holds when informed speculation is sufficiently rare—including the limiting case of $\phi \to 0$ implicitly assumed in many prior studies.

When informed speculation is sufficiently prevalent, the opposite can occur. Liquidity-exposed shareholders face substantial adverse selection costs in the benchmark, so the benefit from reduced speculator profits can more than offset the wealth transfer to liquidity-insulated shareholders.

Proposition 3. *When informed speculation is sufficiently prevalent ($\phi > \bar{\phi}$), the expected payoff of liquidity-exposed shareholders increases with the informativeness of buybacks ($\frac{\partial U_B^E}{\partial b_0} < 0$).*

Proposition 3 suggests that the firm can use informed buybacks to protect its liquidity-exposed shareholders from adverse-selection trading costs, consistent with the findings of Wiggins (1994) who documents that the adverse selection component of the bid-ask spread tends to widen before the authorization of a buyback program and narrow afterward. More recently, Hillert et al. (2016) conclude that "the information content of repurchases is not associated with a deterioration of liquidity [...] higher information content seems to be associated with improvements and not with deterioration in liquidity at the time repurchases were executed."

The preceding analysis might suggest that uninformed buybacks are benign—they minimize wealth transfers to insiders while avoiding the complications of informed execution. They are not.

Corollary 1. *Relative to the benchmark without buybacks (Lemma 1), a buyback program strictly lowers the expected payoff of the firm's liquidity-exposed shareholders when buybacks are uninformed ($b_0 = 1$) and informed speculation is present ($\phi > 0$).*

At first glance, Corollary 1 may seem puzzling. Uninformed buybacks—which are always executed regardless of firm fundamentals—neither make nor lose money in expectation. Why should they harm liquidity-exposed shareholders?

The crux of the result is that the speculator's informed trading induces a correlation between the liquidity trades of liquidity-exposed shareholders and the profitability of buybacks. The presence of informed speculative trading ($\phi > 0$) results in an equilibrium pricing rule that increases with order flow even when buybacks are uninformed. When liquidity-exposed shareholders sell to meet liquidity needs, they simultaneously reduce their stake in the firm and push down the price at which buybacks are executed. Consequently, they are less likely to retain shares in states where buybacks generate gains. Even though uninformed buybacks break even in expectation, liquidity-exposed shareholders receive a disproportionately small share of the gains and bear a disproportionately large share of the losses. This correlation causes liquidity-exposed shareholders to incur net losses from uninformed buybacks. Such a channel is absent in conventional models without buybacks, where informed speculation affects only the price at which liquidity-exposed shareholders sell, not the per-share value of the shares they retain.

The stock buyback literature often emphasizes how informed buybacks can hurt liquidity-exposed shareholders (e.g., Barclay and Smith (1988), Brockman and Chung (2001), Buffa and

Nicodano (2008), Fried (2013), Babenko et al. (2020)). This conventional view suggests that firms could protect them by committing not to use the manager's private information when executing buybacks. The analysis in this section shows that this view is incomplete. While informed buybacks do transfer wealth to liquidity-insulated shareholders, uninformed buybacks are not a neutral alternative. They subject liquidity-exposed shareholders to additional adverse-selection costs arising from the speculator's informed trades. In fact, when informed speculation is sufficiently prevalent, informed buybacks can actually benefit liquidity-exposed shareholders by reducing the speculator's profits (Proposition 3). The desirability of informed versus uninformed buybacks thus depends critically on the level of informed speculation already present in the market.

IV Manager's Buyback Strategy

This section examines the optimal buyback strategy of a manager who maximizes $\mathbb{E}[\omega P + V]$, where P is the firm's stock price at $t = 1$, V is the firm's per-share value at $t = 2$, and $\omega \geq 0$ captures her concern for the firm's interim stock price. When $\omega = 0$, the manager only cares about the firm's per-share value at $t = 2$. As ω increases, she places greater emphasis on the interim stock price. In the limiting case as $\omega \to \infty$, her objective is driven entirely by the interim stock price.

Recall that the manager's buyback strategy specifies the probability with which she executes buybacks when firm fundamentals are high (b_1) and when they are low (b_0). When firm fundamentals are high ($A = 1$), executing buybacks is a dominant strategy for the manager. Buying back x shares strictly increases the expected market-clearing stock price at $t = 1$ and generates trading profits that raise the per-share value at $t = 2$. Hence, when the manager learns that firm fundamentals are high, she executes buybacks with certainty ($b_1^* = 1$).

However, when firm fundamentals are low ($A = 0$), the manager faces a trade-off. Executing buybacks increases the expected market-clearing stock price at $t = 1$—because the equilibrium pricing rule is increasing in order flow—but generates trading losses that reduce per-share value at $t = 2$. The optimal buyback strategy depends on her concern about the interim stock price (ω).

Proposition 4. *Upon learning that firm fundamentals are high, the manager executes buybacks with certainty ($b_1^* = 1$). Upon learning that firm fundamentals are low, she executes buybacks with probability b_0^*:*

$$b_0^* = \begin{cases} 0 & \omega < \underline{\omega} \\ \frac{(\omega-k)[\theta(1-\phi)(1+k)+(1-\theta)]-\theta k(1-\phi)(1+k)}{(1-\theta)k[(1-\phi)(1+k)-(\omega-k)]} & \omega \in [\underline{\omega}, \bar{\omega}] \\ 1 & \omega > \bar{\omega}, \end{cases}$$

where $0 < \underline{\omega} < \bar{\omega}$.[19]

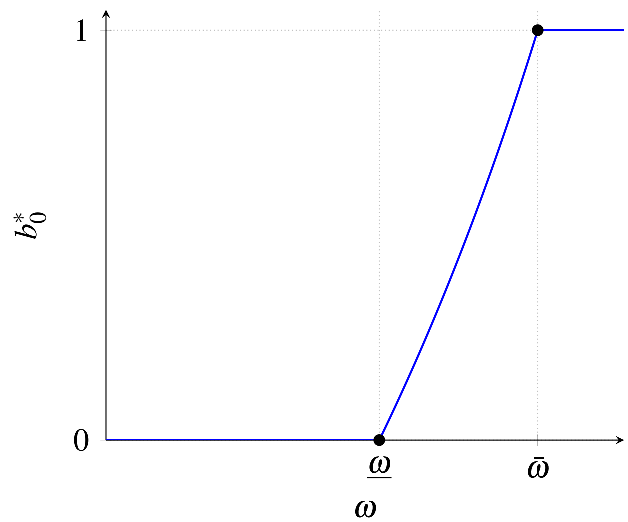
When the manager places little weight on the interim stock price ($\omega < \underline{\omega}$), she never buys back overvalued shares. For intermediate values ($\omega \in [\underline{\omega}, \bar{\omega}]$), the probability of buyback execution increases continuously with ω as the manager becomes increasingly inclined to inflate the stock price by buying back overvalued shares. When her concerns about the interim stock price are strong ($\omega > \bar{\omega}$), she buys back shares regardless of firm fundamentals. Figure 3 illustrates this relationship. These predictions align with the evidence that managers facing stronger short-term incentives execute more value-destroying buybacks (e.g., Edmans, Fang, and Huang (2022), Almeida, Fos, and Kronlund (2016), Cheng, Harford, and Zhang (2015)).

Proposition 5. *The informativeness of buybacks increases with expected fundamentals (θ) and the scale of the buyback program (k), and decreases with the prevalence of informed speculation (ϕ).*

Firm characteristics and market conditions affect the manager's buyback strategy by shaping the costs and benefits of buying back overvalued shares. A higher expected value of firm fundamentals (θ) raises the expected stock price, increasing the losses from buying back overvalued shares. Similarly, a larger buyback program (k) amplifies the per-share trading losses of buybacks in low-fundamental states. Both effects make the manager less willing to execute buybacks when firm fundamentals are low, increasing the informativeness of buybacks. In contrast,

[19] The restriction that $x \leq 1-\theta$ introduced in Section II guarantees that $\underline{\omega} < \bar{\omega}$, implying that the manager's buyback decision upon learning that $A = 0$ (b_0^*) increases continuously with ω. Without this restriction, multiple equilibria ($b_0^* = 1$ and $b_0^* = 0$) are possible for intermediate values of ω.

Figure 3: Manager's optimal buyback decision (b_0^*) as a function of ω. For low $\omega < \underline{\omega}$ the manager never executes the buyback, for intermediate $\omega \in [\underline{\omega}, \bar{\omega}]$ she executes with an interior probability, and for high $\omega > \bar{\omega}$ she executes the buyback with certainty. Hence, the informativeness of buybacks worsens with ω.



when informed speculation (ϕ) is more prevalent, the pricing rule responds more sharply to order flow, making it easier for the manager to inflate the interim stock price by buying back overvalued shares—thereby reducing the informativeness of buybacks.

When shareholders anticipate the manager's equilibrium strategy, they can infer the informativeness of buybacks from firm characteristics and market conditions. The next section examines when they would benefit from authorizing a buyback program.

V Buyback Authorization

This section examines when shareholders would authorize a buyback program at $t = 0$. Because the authorization precedes the arrival of private information, shareholders form expectations about how the manager will execute buybacks. Proposition 4 establishes that the manager's equilibrium buyback strategy—and hence the anticipated informativeness of buybacks—depends on her concern about the interim stock price (ω), firm characteristics (θ), and market conditions (x, ϕ). Because shareholders with different liquidity exposures do not benefit equally from buybacks, the authorization decision depends on the firm's ownership composition and governance structure.

This analysis distinguishes between outside shareholders and insiders, who own fractions $s \geq x$ and $1-s$ of the firm, respectively.[20] Outside shareholders may experience liquidity needs that force them to sell x shares at $t=1$. In contrast, insiders—such as managers, directors, and blockholders with stable positions—are liquidity-insulated, holding their shares until $t=2$ with certainty. Using the payoffs derived in Section III.C, the expected payoffs of outside shareholders and insiders are

$$U^{Outside} = U^E + \left(\tfrac{s-x}{1-x}\right) U^I \tag{14}$$

and

$$U^{Insider} = \left(\tfrac{1-s}{1-x}\right) U^I, \tag{15}$$

where the scaling reflects that U^I is the payoff to the $1-x$ liquidity-insulated shares. When $s=x$, outside shareholders are fully exposed to liquidity shocks. When $s>x$, they retain some shares until $t=2$ with certainty, and partially benefit from buyback trading gains.

I consider three governance structures that differ in whose interests the board represents in authorizing a buyback program at $t=0$. The first is an insider-aligned board that maximizes insider payoffs. The second maximizes the aggregate payoff of existing shareholders at $t=2$. The third weighs shareholder interests in proportion to ownership.

Insider-Aligned Board. Because the buyback program generates weakly positive expected trading gains (Lemma 6), insiders benefit from buybacks. Hence, an insider-aligned board always authorizes, implying that restrictions on authorization come from outside shareholder influence.

Aggregate Payoff Maximization. Suppose the board maximizes the aggregate payoff of all existing shareholders. Proposition 1 implies a cutoff rule: authorize if and only if buybacks are

[20] Estimates of insider holdings in repurchasing firms range from 15% to 20% (Fried (2005)).

anticipated to be sufficiently informed ($b_0^* < \bar{b}_0$). Proposition 5 then suggests that authorization is more likely when expected firm fundamentals (θ) are higher, informed speculation (ϕ) is less prevalent, and market conditions support larger buyback programs (k).

The intuition follows from the manager's execution incentives. Higher expected fundamentals and larger programs make bad-state buybacks more costly, increasing the anticipated informativeness of buybacks. Greater liquidity (lower ϕ) reduces the price impact of order flow, limiting the manager's ability to inflate the interim stock price with bad-state buybacks. These factors increase the likelihood that the anticipated informativeness of buybacks exceeds the authorization threshold.

These predictions align with documented patterns of buyback activity. The procyclical nature of authorizations documented by Jagannathan et al. (2000) and Dittmar and Dittmar (2008) is consistent with firms authorizing when expected fundamentals are high. Notably, this prediction concerns ex-ante expectations at the time of authorization, not ex-post realizations—firms authorize when they expect fundamentals to be strong, which differs from the undervaluation hypothesis that firms repurchase when they believe their stock is currently under-priced. The empirical finding that firms with more liquid shares are more likely to authorize buyback programs (Brockman et al., 2008) is consistent with the liquidity prediction.

Proportional Representation. Suppose the board authorizes a buyback program if the proportion of the firm's existing shareholders who benefit exceeds a threshold $\tau \in (0,1)$. For instance, majority rule corresponds to a threshold of $\tau = 0.5$. The authorization decision then depends on ownership composition (s), the prevalence of informed speculation (ϕ), and the anticipated informativeness of buybacks (b_0^*).

When outside shareholder ownership is low ($s < \tau$), insiders determine the outcome. Here, the authorization follows the insider-aligned case, so the board authorizes the buyback program.

When outside shareholder ownership is high ($s \geq \tau$), their preferences become pivotal. If informed speculation is rare, outside shareholders lose from any buyback program. Uninformed buybacks amplify adverse selection costs, increasing the wealth transfer to the speculator. Informed buybacks are even worse—the wealth transfer to insiders dominates the reduction in speculator profits. Authorization fails when informed speculation is sufficiently rare, as both uninformed and informed buybacks harm outside shareholders in this case.[21]

If informed speculation is prevalent, the situation is more nuanced. Uninformed buybacks remain harmful—and are in fact more damaging because the wealth transfer to the speculator is larger. However, sufficiently informed buybacks can benefit outside shareholders: the reduction in speculator profits offsets the wealth transfer to insiders.[22] Authorization passes if anticipated execution is sufficiently informed. There is a subtle tension: more prevalent informed speculation (higher ϕ) makes reducing the speculator's trading profits more valuable to outside shareholders—but simultaneously reduces buyback informativeness (Proposition 5), thereby weakening the competition effect that delivers this reduction.

When informed speculation is rare, firms with dispersed ownership face a conflict: insiders prefer authorization, but outside shareholders—who may constitute the majority—are harmed by any buyback program. This conflict can lead to two types of inefficiency. Insiders may push through authorization over outside shareholder objections, transferring wealth to themselves without providing offsetting benefits for outside shareholders. Outside shareholders may block authorization, forgoing informed buybacks that would have increased aggregate shareholder payoffs. When informed speculation is prevalent, this tension eases: outside shareholders can benefit from sufficiently informed buybacks, aligning their preferences with insiders. The welfare implications of buyback authorization thus depend not only on governance, but also on market conditions that determine how buybacks are executed.

[21] Corollary 1 and Proposition 2 establish these results for the case where outside shareholders are fully liquidity-exposed ($s = x$). The qualitative logic extends to $s > x$.

[22] Proposition 3 establishes this result for $s = x$; the same underlying logic extends to $s > x$.

VI Model Extensions and Applications

VI.A Buyback Disclosure

The baseline model assumes that the market only observes the aggregate order flow. In practice, however, regulators have sought to expand the disclosure requirements of buyback activity. For instance, in 2004, the SEC began requiring firms to report monthly buyback activity in their quarterly filings. In 2023, the SEC adopted rules mandating reports of daily buyback activity, though these rules were subsequently vacated by the courts. The policy rationale for enhanced disclosure centers on the adverse selection problem: insiders may use the manager's informational advantage to execute buybacks in a way that transfers wealth from outside shareholders to themselves.

This section analyzes how buyback disclosures affect the trading equilibrium. Specifically, I assume that the market observes both the aggregate order flow (q) and the firm's buyback order (q_B) before setting prices—a scenario I refer to as the pre-trade buyback disclosure regime (denoted with superscript D). The speculator does not observe the firm's buyback order prior to submitting his order. As in Section III.A, I assume that the manager's buyback strategy is $(1, b_0)$.[23]

Let θ_x and θ_0 be the market's posterior belief about firm fundamentals conditional on observing $q_B = x$ and $q_B = 0$, respectively. Because the manager always executes buybacks when firm fundamentals are high, the absence of disclosed buybacks ($q_B = 0$) fully reveals that firm fundamentals are low: $\theta_0 = 0$. In this case, the market-clearing price equals zero for all order flows.

In contrast, the disclosure of buybacks ($q_B = x$) indicates that firm fundamentals are more likely to be high: $\theta_x = \frac{\theta}{\theta+(1-\theta)b_0} \geq \theta$, strictly so when buybacks are informed ($b_0 < 1$). In this case, the trading equilibrium is isomorphic to the one characterized in Lemma 2, with θ_x replacing θ and buybacks occurring with certainty. Hence, given buybacks ($q_B = x$), the equilibrium pricing

[23] The proof of Proposition 7 shows that always buying when firm fundamentals are high ($b_1^* = 1$) remains optimal for the manager.

rule is

$$(16) \qquad P_B^D(q) = \begin{cases} 0 & \text{if } q = -x, \\ \frac{\theta_x(1-\phi)}{\theta_x(1-\phi)+(1-\theta_x)} & \text{if } q = 0, \\ \theta_x & \text{if } q = x, \\ 1 & \text{if } q = 2x. \end{cases}$$

As before, the speculator buys x shares if and only if he learns that firm fundamentals are high.

Lemma 7. *Pre-trade disclosure eliminates expected buyback trading profits ($\mathbb{E}[T^D] = 0$).*

With pre-trade disclosure, the market always observes whether buybacks are occurring. As a result, the manager has no informational advantage vis-à-vis the market, and the buyback program cannot generate positive expected trading profits. Lemma 7 implies that pre-trade buyback disclosure eliminates the wealth transfer from outside shareholders to insiders studied in Section III.C. This result is consistent with arguments in the literature that pre-trade disclosure prevents insiders from profiting at the expense of outside shareholders (e.g., Fried (2005)).

However, this analysis is incomplete in the presence of informed speculative trading ($\phi > 0$). Lemma 4 establishes that buybacks also induce a dispersion effect that increases the value of any remaining informational advantage held by the speculator. As a result, even with pre-trade disclosure, the economic consequences of buybacks still depend on their informativeness.

Proposition 6. *Under pre-trade disclosure, a buyback program decreases the speculator's expected trading profit relative to the benchmark if and only if buybacks are sufficiently informed.*

Buybacks continue to generate two opposing effects in the pre-trade buyback disclosure regime. First, buybacks convey information to the market — though under this regime, information transmission occurs directly through disclosure rather than indirectly through order flow. This competition effect erodes the speculator's informational advantage. Second, buybacks increase the dispersion in per-share value across fundamental states. This dispersion effect makes the speculator's private information more valuable for trading. Consequently, buybacks decrease the speculator's expected trading profit if and only if they are sufficiently informed.

Because disclosure eliminates the wealth transfer to insiders, the expected payoff of the firm's outside shareholders depends solely on the transfer to the speculator: $U_B^{DO} = x\theta - \Pi_B^D$. Consequently, they strictly prefer more informed buybacks: $\frac{\partial U_B^{DO}}{\partial b_0} = -\frac{\partial \Pi_B^D}{\partial b_0} < 0$.

Thus far, I have taken the manager's strategy as given. The following demonstrates that the pre-trade disclosure regime also affects the manager's optimal buyback strategy.

Proposition 7. *The pre-trade buyback disclosure regime makes the manager's optimal buyback strategy less informed relative to the baseline model.*

The crux of Proposition 7 is that pre-trade disclosure increases the sensitivity of the interim stock price to buybacks. If the manager does not buy back shares, the market infers that firm fundamentals are low ($A = 0$), and the stock price falls. Hence, she faces stronger incentives to execute buybacks when firm fundamentals are low, resulting in a less informed buyback strategy.

These results have nuanced policy implications. Pre-trade disclosure eliminates wealth transfers from outside shareholders to insiders, but it does not eliminate the speculator's trading profits. Outside shareholders, therefore, still prefer more informed buybacks to limit their losses to the speculator. However, disclosure itself reduces the informativeness of buybacks: by punishing non-execution—the market infers low fundamentals when no buyback is disclosed—the regime strengthens the manager's incentive to buy back overvalued shares. The net effect of mandatory disclosure on outside shareholder welfare, therefore, depends on whether the benefit of eliminating the wealth transfer to insiders outweighs the cost of reduced buyback informativeness.

VI.B Other Frictions Affecting Buyback Strategy

The baseline model assumes that the manager executes buybacks to maximize $\mathbb{E}[\omega P + V]$, a weighted combination of the firm's $t = 1$ stock price (P) and its $t = 2$ per-share value (V). Under this objective, the manager always executes buybacks when she learns that fundamentals are high ($A = 1$) because doing so strictly increases both the stock price and per-share value. Because the manager is perfectly informed about firm fundamentals and faces no additional constraints, she executes good-state buybacks with certainty.

However, many frictions can prevent the manager from executing buybacks when fundamentals are high. The manager may have imperfect information about fundamentals, limiting her ability to identify good states. Financing constraints may leave the manager without the resources to buy back shares. Regulatory constraints and blackout periods may restrict trading windows. This section extends the analysis of Section III.A to accommodate these possibilities, characterizing equilibrium outcomes for a more general buyback strategy (b_1, b_0), with $b_1 \geq b_0$.[24]

Here, the manager does not always buy back shares when firm fundamentals are high ($b_1 < 1$). As a result, informativeness has two dimensions: the probability of good-state buybacks (b_1) and the probability of bad-state buybacks (b_0). For a given b_0, increasing b_1 increases informativeness; for a given b_1, decreasing b_0 increases informativeness. The baseline model fixes $b_1 = 1$ and captures informativeness by varying b_0.

Lemma 8. *The manager's buyback strategy (b_1, b_0) determines the competitive impact of buybacks through market informativeness:*

1. *More informed buybacks improve market informativeness ($\frac{\partial \Delta\hat{\theta}_B}{\partial b_1} > 0$ and $\frac{\partial \Delta\hat{\theta}_B}{\partial b_0} < 0$).*
2. *A buyback program improves market informativeness relative to the benchmark ($\Delta\hat{\theta}_B > \Delta\hat{\theta}_0$) if and only if buybacks are sufficiently informed:*
   - *For $b_1 > 0$, there exists a $\underline{b}_0 \in (0, b_1)$ such that $\Delta\hat{\theta}_B > \Delta\hat{\theta}_0 \Leftrightarrow b_0 < \underline{b}_0$.*
   - *For $b_0 < 1$, there exists a $\underline{b}_1 \in (b_0, 1)$ such that $\Delta\hat{\theta}_B > \Delta\hat{\theta}_0 \Leftrightarrow b_1 > \underline{b}_1$.*

The results in Lemma 8 follow from how the buyback strategy shapes market inferences. When the manager buys more aggressively in good states (higher b_1), large positive order flows

[24]For instance, suppose the manager receives a noisy signal $\sigma_M \in \{H, L\}$ about firm fundamentals, with $\Pr(\sigma_M = H|A = 1) = \frac{1}{2}(1+\rho) = \Pr(\sigma_M = L|A = 0)$, where $\rho \in (0,1)$ captures the noisy signal's precision. When $\omega = 0$ and ρ is not too small, the manager's optimal strategy is to execute buybacks if and only if $\sigma_M = H$, corresponding to $b_1^* = \frac{1}{2}(1+\rho) < 1$ and $b_0^* = \frac{1}{2}(1-\rho) > 0$, making both dimensions of informativeness relevant. The baseline model corresponds to the limiting case $\rho \to 1$.

become stronger signals of high firm fundamentals ($A = 1$). Conversely, when she buys more in bad states (higher b_0), she adds noise that makes large positive order flows less indicative of high firm fundamentals. As in the baseline model, Lemma 8 implies that uninformed buybacks ($b_1 = b_0 = b$) weakly decrease market informativeness, strictly so if $b < 1$. Effectively, uninformed buybacks inject additional noise into trading without improving the information contained in order flows.

The dispersion effect is more nuanced in this setting. Recall that the dispersion in the firm's expected per-share value between good ($A = 1$) and bad ($A = 0$) states is given by $\Delta V = E[V|A = 1] - E[V|A = 0]$. In the benchmark without buybacks, this dispersion simply equals the fundamental spread in asset payoffs: $\Delta V_0 = 1$. With buybacks, the dispersion becomes

$$\Delta V_B = \big(1 + \underbrace{\mathbb{E}[T|A=1]}_{=b_1 \bar{T}_G \geq 0}\big) - \big(0 + \underbrace{\mathbb{E}[T|A=0]}_{=-b_0 \bar{T}_L \leq 0}\big) = \Delta V_0 + b_1 \bar{T}_G + b_0 \bar{T}_L, \tag{17}$$

where $\bar{T}_G$ and $\bar{T}_L$ are the magnitudes of the expected trading gains and losses from executing buybacks when the firm's fundamentals are high ($A = 1$) and low ($A = 0$).

The buyback strategy (b_0, b_1) affects the dispersion through two channels: a direct trading channel and an indirect spillover channel. The following decomposition reveals an asymmetry—dispersion unambiguously increases with bad-state buybacks but can increase or decrease with good-state buybacks:

$$\frac{\partial \Delta V_B}{\partial b_0} = \underbrace{\left(\bar{T}_L + b_0 \frac{\partial \bar{T}_L}{\partial b_0}\right)}_{\text{Trading}} + \underbrace{\left(b_1 \frac{\partial \bar{T}_G}{\partial b_0}\right)}_{\text{Spillover}} > 0 \tag{18}$$

and

$$\frac{\partial \Delta V_B}{\partial b_1} = \underbrace{\left(\bar{T}_G + b_1 \frac{\partial \bar{T}_G}{\partial b_1}\right)}_{\text{Trading}} + \underbrace{\left(b_0 \frac{\partial \bar{T}_L}{\partial b_1}\right)}_{\text{Spillover}} \gtrless 0. \tag{19}$$

More bad-state buybacks (higher b_0) increase dispersion through both the direct trading and the indirect spillover channels. First, they deepen expected buyback losses, reducing per-share value when fundamentals are weak. Second, they make the order flow less informative, lowering the expected market-clearing price in good states ($A = 1$) and increasing the profitability of good-state buybacks ($\bar{T}_G$). Consequently, bad-state buybacks unambiguously increase dispersion.

In contrast, more buybacks in good states (higher b_1) have a more nuanced effect on dispersion. The direct trading channel works as before—good-state buybacks expand expected gains, enhancing per-share value when firm fundamentals are high and increasing dispersion. However, the indirect spillover channel now features a countervailing force—good-state buybacks make the order flow more informative, lowering the expected market-clearing price in bad states and limiting the losses of bad-state buybacks ($\bar{T}_L$). The trading channel dominates when the buyback program size is large (high k)—increasing expected trading profits—or when bad-state buybacks are rare (low b_0)—making the spillover effect less relevant.

Lemma 9. *A buyback program strictly increases the dispersion of the firm's per-share value across good and bad states ($\Delta V_B > \Delta V_0$). The magnitude of this effect depends on the execution strategy (b_0, b_1):*

- *Bad-state buybacks (b_0) unambiguously increase value dispersion.*
- *Good-state buybacks (b_1) increase value dispersion when bad-state buybacks are sufficiently infrequent.*

These two effects—competition reducing the speculator's informational advantage, dispersion raising the stakes of informed trading—jointly determine the speculator's expected trading profit.

Proposition 8. *The speculator's expected trading profit decreases with the informativeness of buybacks:*

- *Bad-state buybacks unambiguously increase the speculator's expected profit* ($\frac{\partial \Pi_B}{\partial b_0} > 0$).

- *Good-state buybacks decrease the speculator's expected profit* ($\frac{\partial \Pi_B}{\partial b_1} < 0$) *when the buyback program is not too large* ($k < 1$).

Relative to the benchmark, a buyback program decreases the speculator's expected trading profit if and only if buybacks are sufficiently informed:

- *For* $b_1 > 0$*, there exists a* $\underline{b}_0 \in (0, b_1)$ *such that* $\Pi_B < \Pi_0 \Leftrightarrow b_0 < \underline{b}_0$.

- *For* b_0 *not too large, there exists a* $\bar{b}_1 \in (b_0, 1)$ *such that* $\Pi_B < \Pi_0 \Leftrightarrow b_1 > \bar{b}_1$.

The effect of bad-state buybacks (b_0) on speculator profit is unambiguous. More bad-state buybacks reduce market informativeness and increase value dispersion, both of which benefit the speculator. The effect of good-state buybacks (b_1) is more nuanced. They strengthen the competition effect, eroding the speculator's informational advantage. However, they can also amplify value dispersion due to the trading profits they generate. When the buyback program is not too large ($k < 1$), the competition effect dominates.[25]

Despite this nuance, the overall message is unchanged: uninformed buybacks benefit the speculator at shareholders' expense. When $b_1 = b_0 < 1$, buybacks amplify value dispersion while injecting noise that worsens market informativeness. The core insight from the baseline model—that uninformed buybacks harm shareholders by increasing the speculator's profits—extends to this more general setting with two dimensions of buyback informativeness.

VII Discussion

VII.A Payout Benefits and Adverse Selection

The analysis in Section IV demonstrates how managerial concerns about the firm's interim stock price can limit the informativeness of buybacks. However, constraints on buyback informativeness need not stem from agency conflicts or myopic price concerns. Many legitimate economic

[25] The threshold of $k < 1$ corresponds to the firm buying back less than half of the firm's outstanding shares, which is well above typical buyback activity—SEC Rule 10b-18's safe harbor limits daily repurchases to 25% of average daily volume, and most programs retire only a small fraction of shares outstanding over their duration.

forces can lead firms to execute buybacks without regard to whether shares are under- or overvalued.

Firms may repurchase shares to offset dilution from employee equity compensation programs (Kahle (2002), Bens, Nagar, Skinner, and Wong (2003)) or to enhance the incentive effects of broad-based equity pay (Babenko (2009)). Unexpected cash flow windfalls may prompt buybacks as a means of distributing excess cash (Guay and Harford (2000)). More broadly, buybacks offer well-documented advantages as a payout mechanism: favorable tax treatment relative to dividends, flexibility to adjust payouts without the negative signal associated with dividend cuts, and discipline over free cash flow that might otherwise be wasted on negative-NPV projects. These benefits create pressure to buy back shares consistently—corresponding to uninformed buybacks—which harm liquidity-exposed shareholders by amplifying adverse selection costs.

This tension highlights a fundamental distinction between dividends and stock buybacks as mechanisms for committing to payouts. A dividend payment reduces per-share value equally in both good and bad states—the firm has less cash regardless of fundamentals. Buybacks, by contrast, generate state-dependent changes in per-share value: repurchasing undervalued shares increases per-share value in good states, while repurchasing overvalued shares decreases it in bad states. Even when buybacks are executed without regard to fundamentals, they increase the dispersion of per-share value across states. This dispersion effect makes informed trading more profitable when the firm commits to buybacks—a feature absent with dividends.

The framework offers guidance for payout policy. When informed speculation is rare, the adverse selection costs of uninformed buybacks are modest, and firms can capture the tax and flexibility benefits of repurchases with limited harm to outside shareholders. When informed speculation is prevalent, uninformed buybacks impose substantial costs on liquidity-exposed shareholders. In such environments, firms face a choice: execute buybacks more selectively—conditioning on private information about fundamentals—or substitute toward dividends, which return cash to shareholders without amplifying the profitability of informed trading. Notably, recent evidence suggests that firms increasingly treat buybacks as more rigid than conventional narratives imply, with persistent execution even when conditions deteriorate (Almeida et al. (2025)), corresponding to uninformed buybacks in the model. Combined with the secular shift from dividends to buybacks, this pattern may have distributional consequences for shareholders with different investment horizons, beyond the tax and flexibility considerations typically emphasized in the literature.

VII.B Endogenous Information Acquisition

The baseline analysis takes informed speculation (ϕ) as exogenous. Because buybacks affect the speculator's trading profits, a natural question is how endogenous information acquisition affects the main results.

For uninformed buybacks, endogenous acquisition generally reinforces the baseline conclusions. Uninformed buybacks increase trading profits through the dispersion effect, raising the return to information acquisition. The speculator responds with more information acquisition, further amplifying adverse selection costs for liquidity-exposed shareholders.

However, this effect can be beneficial in settings where informed trading generates value beyond its direct effect on prices. If the manager is uninformed about fundamentals but can exercise real options—such as additional investment or abandonment—prices convey information that improves these decisions. In such settings, uninformed buybacks can indirectly enhance price informativeness: by raising trading profits, they spur information acquisition, which increases the speculator's informed trading. This mechanism complements the project commitment channel identified by Dow, Goldstein, and Guembel (2017) and may be preferable when the adverse selection costs of uninformed buybacks are smaller than the losses from inefficient project selection.

For informed buybacks, the effect is more subtle. Sufficiently informed buybacks reduce trading profits through the competition effect, discouraging information acquisition. In the extreme, informed buybacks may eliminate speculative trading entirely, leaving the manager as the sole informed trader. This outcome need not benefit liquidity-exposed shareholders. Although they no longer face adverse selection from the speculator, they now face a manager whose informed buybacks transfer wealth without competitive discipline. Paradoxically, the speculator provides a service to liquidity-exposed shareholders: by competing against the manager's informed buybacks, the speculator limits her ability to generate trading profits.

VII.C Investment in Risky Production

Shareholders with different liquidity exposures may disagree about risky projects even when they agree on expected profitability. Projects that increase fundamental uncertainty also increase the profitability of informed trading. Liquidity-exposed shareholders bear these adverse selection costs, making them more reluctant to invest. This disagreement can prevent the firm from undertaking NPV-positive investments.

Sufficiently informed buybacks can help align shareholder preferences by reducing the adverse selection costs that liquidity-exposed shareholders face. This implication is consistent with Huang and Thakor (2013), who document that buyback announcements reduce shareholder disagreement about investments and increase subsequent investment. Conversely, uninformed buybacks expand disagreement and discourage investment, lending credence to concerns that buybacks may crowd out productive investment—not through capital constraints, but through amplified shareholder disagreement. As with the payout policy tradeoff, the effect of buybacks on investment depends critically on the informativeness of execution.

VII.D Policy Implications

This framework also addresses regulations governing stock buybacks. Many regulatory provisions and market practices limit the manager's ability to condition execution on private information: Rule 10b5-1 plans commit firms to buyback schedules set before receiving private information; accelerated share repurchases contract with intermediaries to deliver shares at prices determined by subsequent trading; SEC Rule 10b-18's safe-harbor conditions and voluntary blackout periods restrict timing around sensitive dates. The conventional rationale is that such restrictions protect shareholders from informed insider trading.[26]

The analysis suggests this intuition is incomplete. By mandating or encouraging uninformed execution, these provisions eliminate the competition effect while preserving the dispersion effect—increasing the speculator's trading profits at shareholders' expense. When informed speculation is prevalent, restricting the informativeness of buybacks may harm rather than help liquidity-exposed shareholders (Proposition 3).

The asymmetry between good-state and bad-state buybacks (Section VI.B) suggests that ideal regulation would discourage bad-state buybacks while preserving good-state buybacks. In practice, such targeted regulation is difficult to implement—most provisions restrict the manager's ability to condition on private information without distinguishing whether she would buy undervalued or overvalued shares. This limitation underscores why blanket restrictions on informed execution can be counterproductive: they curtail both good-state and bad-state buybacks.

VII.E Additional Testable Implications

My framework yields several testable implications, organized into three categories: trading outcomes, buyback execution, and shareholder payoffs.

Trading Outcomes. The model predicts that more informed buybacks reduce trading profits for informed speculators through the competition effect, while less informed buybacks increase these profits through the dispersion effect (Proposition 1). Empirically, measures of informed trading profitability—such as the profits of short-term institutional investors or the price impact of trades—should decrease when buybacks track fundamentals more closely. Appendix C.A shows that these forces also affect returns: more informed buybacks are associated with lower return volatility, while less informed buybacks amplify volatility by increasing per-share value dispersion.

[26]For instance, Rule 10b5-1 governs both an insider's personal trades and the firm's buybacks. Committing an insider mitigates adverse selection from her private information and makes other shareholders no worse off. Committing the firm's buybacks, however, eliminates the competition effect while preserving the dispersion effect, increasing the speculator's profits at the expense of liquidity-exposed shareholders. The same instrument can thus improve or worsen information asymmetry depending on whose trades it constrains.

Buyback Execution. The informativeness of buyback execution depends on managerial incentives (Proposition 4). While existing evidence documents that short-term incentives are associated with lower-quality buybacks (e.g., Edmans et al. (2022)), the model generates additional predictions about cross-sectional variation.

Firms with compensation structures that balance short- and long-term performance should exhibit the strongest sensitivity to the factors that determine buyback informativeness. The procyclical pattern of authorization and the positive relationship between liquidity and informativeness should be most pronounced among firms with balanced incentives. Firms at either extreme—whether heavily short-term or heavily long-term focused—should exhibit weaker sensitivity to these factors. Changes in compensation structure provide another testable prediction. Firms that shift toward more balanced incentives should subsequently exhibit greater sensitivity to the determinants of buyback informativeness identified in Proposition 5.

Shareholder Welfare. The model predicts heterogeneous effects across shareholder groups. Liquidity-insulated shareholders benefit from informed buybacks because they hold until fundamentals are revealed, capturing buyback profits without facing adverse selection. Liquidity-exposed shareholders face a more complex tradeoff: informed buybacks transfer wealth to liquidity-insulated shareholders but also reduce the speculator's profits. Which effect dominates depends on the prevalence of informed speculation.

These predictions can be tested by examining how different investor types respond to buyback announcements. Insiders and long-horizon institutions (e.g., pension funds, index funds) proxy for liquidity-insulated shareholders; retail investors and short-horizon institutions facing redemption pressures proxy for liquidity-exposed shareholders. Measures of informed speculation—such as the probability of informed trading (PIN), price impact, or the concentration of sophisticated institutional ownership—can capture cross-sectional variation in market conditions. The model predicts that liquidity-exposed shareholders react more favorably to buyback announcements when informed speculation is prevalent (Proposition 3) and less favorably when it is rare

(Proposition 2). These distributional effects should also extend to investment: firms with less informed buybacks should have greater shareholder disagreement over risky projects and lower subsequent investment.

VIII Conclusion

This paper analyzes stock buybacks in markets with multiple informed parties. Two countervailing forces shape buyback outcomes. The *competition effect* arises when informed buybacks intensify competition among informed traders, reducing speculative profits and improving price discovery. The *dispersion effect* emerges because buybacks amplify the sensitivity of per-share value to fundamentals, making informed trading more profitable. Sufficiently informed buybacks benefit shareholders in aggregate; uninformed buybacks increase the wealth transfer to the speculator.

A central insight is that shareholders with different liquidity exposures do not benefit equally. Liquidity-insulated shareholders always gain from informed buybacks. Liquidity-exposed shareholders face a tradeoff that depends on market conditions. When informed speculation is prevalent, informed buybacks benefit them by reducing speculator profits; when speculation is rare, the wealth transfer to insiders dominates. This heterogeneity implies that the desirability of buyback authorization also depends on ownership composition and governance structure.

The analysis carries implications for payout policy and regulation. Buybacks generate a dispersion effect absent from dividends, suggesting that the shift toward buybacks may have distributional consequences for shareholders with different investment horizons. Regulations that restrict informed execution—intended to protect shareholders from insider trading—may harm liquidity-exposed shareholders when informed speculation is prevalent by eliminating the competitive discipline that informed buybacks provide.

Several avenues for future research emerge: testing how ownership composition and informed speculation moderate the effects of buybacks on different shareholder groups; examining conditions under which firms should prefer dividends over buybacks; and investigating whether policies aimed at reducing informed speculation have unintended consequences for shareholder welfare.

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A Proofs: Baseline Model

Proof of Lemma 1. Suppose the speculator buys x shares if and only if he learns that the firm's fundamentals are high. Noise traders submit an order of $-x$ and 0 with equal probability. The possible order flows in the different states of the world are

State	Speculator (q_S)	Probability	Order Flow	
$A=0$	0	$1-\theta$	-x	0
$A=1$	0	$\theta(1-\phi)$	-x	0
$A=1$	x	$\theta\phi$	0	x.

Applying Bayes' Rule, the market's posterior that $A=1$ given an order flow q is

$$\hat{\theta}(q) = Prob(A=1|q) = \begin{cases} \frac{\theta(1-\phi)}{1-\theta\phi} & q=-x \\ \theta & q=0 \\ 1 & q=x. \end{cases}$$

Because the firm's per-share value is simply the fundamental payoff of its asset A, the market-clearing condition implies that $P_0(q)=\hat{\theta}(q)$. Taking this pricing rule as given, upon learning that $A=1$, the speculator's expected profit from purchasing x shares is strictly positive: $\frac{x}{2}(1-\theta)>0$. His expected trading profit purchasing x shares upon learning that $A=0$ is strictly negative: $-\frac{x}{2}(1+\theta)<0$. Similarly, his expected profit from purchasing x shares upon learning nothing is also strictly negative: $\frac{x}{2}(\theta-1)<0$. Hence, the speculator buys x shares if and only if he learns that $A=1$. ■

Proof of Lemma 2. Suppose the manager buys back x shares with probabilities $b_1 \geq b_0$ and b_0 when $A=1$ and $A=0$, respectively. Additionally, suppose the speculator buys x shares if and only if he learns that firm fundamentals are high. Noise traders submit an order of $-x$ and 0 with equal probability. The possible order flows in the different states of the world are

State	Firm (q_B)	Speculator (q_S)	Probability	Order Flow		
$A=0$	0	0	$(1-\theta)(1-b_0)$	-x	0	
$A=0$	x	0	$(1-\theta)b_0$		0	x
$A=1$	0	0	$\theta(1-\phi)(1-b_1)$	-x	0	
$A=1$	x	0	$\theta(1-\phi)b_1$		0	x
$A=1$	0	x	$\theta\phi(1-b_1)$		0	x
$A=1$	x	x	$\theta\phi b_1$		x	2x

and imply that the market's posterior belief is

$$\hat{\theta}_B(q) = \Pr(A=1|q) = \begin{cases} \frac{\theta(1-\phi)(1-b_1)}{\theta(1-\phi)(1-b_1)+(1-\theta)(1-b_0)} & \text{if } q=-x, \\ \frac{\theta(1-\phi b_1)}{\theta(1-\phi b_1)+(1-\theta)} & \text{if } q=0, \\ \frac{\theta(\phi+(1-\phi)b_1)}{\theta(\phi+(1-\phi)b_1)+(1-\theta)b_0} & \text{if } q=x, \\ 1 & \text{if } q=2x. \end{cases} \tag{20}$$

An order flow of $q=2x$ fully reveals that $A=1$; hence, $P_B(2x)=1$. An order flow of $q=-x$ fully reveals that no buybacks occurred; hence, $P_B(-x)=\hat{\theta}_B(-x)$. When the order flow is 0, the market makers' pricing rule satisfies

$$P_B(0) = \tfrac{(1-\theta)b_0}{1-\theta\phi b_1}\big(\underbrace{\tfrac{-x}{1-x}}_{-k}P_B(0)\big) + \tfrac{\theta(1-b_1)}{1-\theta\phi b_1} + \tfrac{\theta(1-\phi)b_1}{1-\theta\phi b_1}\big(\underbrace{\tfrac{1}{1-x}}_{1+k} - \tfrac{x}{1-x}P_B(0)\big), \tag{21}$$

implying that

$$P_B(0) = \tfrac{\theta[(1-b_1)+b_1(1-\phi)(1+k)]}{\theta[(1-b_1)+b_1(1-\phi)(1+k)]+(1-\theta)(1+kb_0)}. \tag{22}$$

Similarly, when the order flow is x, the market makers' pricing rule satisfies

$$P_B(x) = \tfrac{(1-\theta)b_0}{\theta[b_1+\phi(1-b_1)]+(1-\theta)b_0}\left(\tfrac{-xP_B(x)}{1-x}\right) + \tfrac{\theta\phi(1-b_1)}{\theta[b_1+\phi(1-b_1)]+(1-\theta)b_0} + \tfrac{\theta b_1}{\theta[b_1+\phi(1-b_1)]+(1-\theta)b_0}\left(\tfrac{1-xP_B(x)}{1-x}\right), \tag{23}$$

implying that

$$P_B(x) = \tfrac{\theta[(1-b_1)\phi+b_1(1+k)]}{\theta[(1-b_1)\phi+b_1(1+k)]+(1-\theta)(1+k)b_0}. \tag{24}$$

Therefore, the equilibrium pricing rule is

$$P_B(q) = \begin{cases} \tfrac{\theta(1-\phi)(1-b_1)}{\theta(1-\phi)(1-b_1)+(1-\theta)(1-b_0)} & \text{if } q=-x, \\ \tfrac{\theta[(1-b_1)+b_1(1-\phi)(1+k)]}{\theta[(1-b_1)+b_1(1-\phi)(1+k)]+(1-\theta)(1+kb_0)]} & \text{if } q=0, \\ \tfrac{\theta[(1-b_1)\phi+b_1(1+k)]}{\theta[(1-b_1)\phi+b_1(1+k)]+(1-\theta)(1+k)b_0} & \text{if } q=x, \\ 1 & \text{if } q=2x, \end{cases} \tag{25}$$

Substituting in $b_1 = 1$ yields the pricing rule in the lemma. Given this pricing rule, upon learning that $A = 1$, the speculator's expected profit from purchasing x shares is positive. His expected trading profit from purchasing x shares upon learning that $A = 0$ or learning nothing is strictly negative. Hence, the speculator buys x shares if and only if he learns that $A = 1$. Note that the effect of buyback profits and losses show up in the pricing rule via the scale of the buyback program k. ■

Proof of Lemma 3. Recall that

$$\Delta\hat{\theta}_0 = \tfrac{1}{2}\phi\left(\hat{\theta}_0(x) - \hat{\theta}_0(-x)\right) = \tfrac{1}{2}\phi\left(\tfrac{(1-\theta)}{\theta(1-\phi)+(1-\theta)}\right) \tag{26}$$

and

$$\Delta\hat{\theta}_B = \tfrac{1}{2}\phi\left(\hat{\theta}_B(2x)-\hat{\theta}_B(0)\right)+\tfrac{1}{2}(1-b_0)\left(\hat{\theta}_B(x)-\hat{\theta}_B(-x)\right) = \underbrace{\tfrac{1}{2}\phi\left(\tfrac{(1-\theta)}{\theta(1-\phi)+(1-\theta)}\right)}_{=\Delta\hat{\theta}_0}+\tfrac{1}{2}(1-b_0)\left(\tfrac{\theta}{\theta+(1-\theta)b_0}\right). \tag{27}$$

Hence, $\Delta\hat{\theta}_B > \Delta\hat{\theta}_0 \Leftrightarrow b_0 < 1$. Taking its derivative with respect to b_0 yields

$$\tfrac{\partial\Delta\hat{\theta}_B}{\partial b_0} = -\tfrac{1}{2}\left(\tfrac{\theta}{[\theta+(1-\theta)b_0]^2}\right) < 0. \tag{28}$$

■

Proof of Lemma 4. Recall that

$$\Delta V_B = \big(1+\underbrace{\mathbb{E}[T|A=1]}_{=\bar{T}_G\geq 0}\big) - \big(0+\underbrace{\mathbb{E}[T|A=0]}_{=-b_0\bar{T}_L\leq 0}\big) = \Delta V_0 + \bar{T}_G + b_0\bar{T}_L, \tag{29}$$

where

$$\bar{T}_G = \tfrac{1}{2}k\left((1-\phi)\tfrac{(1-\theta)(1+kb_0)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)} + \tfrac{(1-\theta)b_0}{\theta+(1-\theta)b_0}\right) > 0 \tag{30}$$

is the magnitude of expected trading gains and

$$\bar{T}_L = \tfrac{1}{2}k\left(\tfrac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)} + \tfrac{\theta}{\theta+(1-\theta)b_0}\right) > 0 \tag{31}$$

is the magnitude of expected trading losses. Hence, $\Delta V_B > \Delta V_0$. Note that

$$\tfrac{\partial \bar{T}_G}{\partial b_0} = \tfrac{1}{2}k\left((1-\phi)\tfrac{(1-\theta)k\theta(1-\phi)(1+k)}{[\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)]^2} + \tfrac{\theta(1-\theta)}{[\theta+(1-\theta)b_0]^2}\right) > 0, \tag{32}$$

$$\tfrac{\partial \bar{T}_L}{\partial b_0} = \tfrac{1}{2}k\left(-P_B(0)\tfrac{(1-\theta)k}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)} - P_B(x)\tfrac{1-\theta}{\theta+(1-\theta)b_0}\right), \tag{33}$$

and

$$\bar{T}_L + b_0\tfrac{\partial \bar{T}_L}{\partial b_0} = \tfrac{1}{2}k\left[P_B(0)\left(1-\tfrac{(1-\theta)kb_0}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)}\right) + P_B(x)\left(1-\tfrac{(1-\theta)b_0}{\theta+(1-\theta)b_0}\right)\right] > 0. \tag{34}$$

Hence, $\frac{\partial \Delta V_B}{\partial b_0} > 0$ (i.e., less informative buybacks magnify the increase in per-share value dispersion). ■

Proof of Lemma 5. Recall that

$$\Delta P_B = \mathbb{E}[P_B|A=1] - \mathbb{E}[P_B|A=0] = \tfrac{1}{2}\phi\left(\tfrac{(1-\theta)(1+kb_0)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)}\right) + \tfrac{1}{2}(1-b_0)\left(\tfrac{\theta}{\theta+(1-\theta)b_0}\right). \tag{35}$$

Taking the derivative of ΔP_B with respect to b_0 yields

$$\tfrac{\partial \Delta P_B}{\partial b_0} = \tfrac{1}{2}\phi\tfrac{(1-\theta)k\theta(1-\phi)(1+k)}{[\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)]^2} - \tfrac{1}{2}\tfrac{\theta}{[\theta+(1-\theta)b_0]^2} < 0 \tag{36}$$

if and only if

$$(1-\theta)\phi(1-\phi)k(1+k) < \tfrac{[\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)]^2}{[\theta+(1-\theta)b_0]^2}. \tag{37}$$

Note that the right-hand side of the inequality (*RHS*) strictly decreases with b_0:

$$\tfrac{\partial RHS}{\partial b_0} = \tfrac{(1-\theta)(\theta\phi(1+k)-1)}{[\theta+(1-\theta)b_0]^2} < 0, \tag{38}$$

because $\theta\phi(1+k)<1$. As a result, it achieves its minimum when $b_0=1$. Note that

$$(39)\qquad (1-\theta)\phi(1-\phi)k(1+k) < \left.\frac{[\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)]^2}{[\theta+(1-\theta)b_0]^2}\right|_{b_0=1} = (1+k)^2(1-\theta\phi)^2$$

because $\phi k(1+k) < (1+k)^2$ and $(1-\theta)(1-\phi) < (1-\theta\phi)(1-\theta\phi)$. Hence, $\frac{\partial \Delta P_B}{\partial b_0} < 0$. ■

Proof of Proposition 1. The speculator's expected trading profit can be written as

(40)
$$\Pi_B = \theta\phi\frac{1}{2}x\left(\frac{1-xP_B(x)}{1-x}-P_B(x)\right) = \theta\phi\frac{1}{2}x(1+k)(1-P_B(x)) = \phi x\theta(1-\theta)\frac{1}{2}(1+k)\left(\frac{b_0}{\theta+(1-\theta)b_0}\right).$$

Taking the derivative of Π_B with respect to b_0 yields

$$(41)\qquad \frac{\partial \Pi_B}{\partial b_0} = \phi x\theta(1-\theta)\frac{1}{2}(1+k)\left(\frac{\theta}{[\theta+(1-\theta)b_0]^2}\right) > 0.$$

In the benchmark without buybacks, the speculator's expected trading profit is $\Pi_0 = \phi x\theta(1-\theta)\frac{1}{2}$. Hence,

$$(42)\qquad \Pi_B < \Pi_0 \Leftrightarrow \frac{(1+k)b_0}{\theta+(1-\theta)b_0} < 1 \Leftrightarrow b_0 < \frac{\theta}{k+\theta} := \bar{b}_0(\theta,k),$$

noting that $\frac{\partial \bar{b}_0}{\partial k} < 0$ and $\frac{\partial \bar{b}_0}{\partial \theta} > 0$. ■

Proof of Lemma 6. The expected per-share trading gain from the firm's buyback activities is

(43)
$$\begin{aligned}\mathbb{E}[T] = &\ (1-\theta)b_0\frac{1}{2}k(-P_B(0)-P_B(x)) + \theta(1-\phi)\frac{1}{2}k(1-P_B(0)+1-P_B(x)) + \theta\phi\frac{1}{2}k(1-P_B(x)) \\ = &\ \frac{1}{2}\theta(1-\theta)(1-\phi)k\left(\frac{(1-b_0)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)}\right) \geq 0,\end{aligned}$$

strictly so when $b_0<1$ and $\phi<1$. Taking its derivative with respect to b_0 yields

$$(44)\qquad \frac{\partial \mathbb{E}[T]}{\partial b_0} = -\frac{1}{2}\theta(1-\theta)(1-\phi)k\left(\frac{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)+(1-\theta)k(1-b_0)}{[\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)]^2}\right) < 0.$$

■

Proof of Proposition 2. Recall that

(45)
$$\begin{aligned}U_B^E = &\ x\theta - (1-x)\mathbb{E}[T] - \Pi_B \\ = &\ x\theta - (1-x)\frac{1}{2}\theta(1-\theta)(1-\phi)k\left(\frac{(1-b_0)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)}\right) - \phi x\theta(1-\theta)\frac{1}{2}(1+k)\left(\frac{b_0}{\theta+(1-\theta)b_0}\right) \\ = &\ x\theta - \frac{1}{2}\theta(1-\theta)\left[(1-x)(1-\phi)k\left(\frac{(1-b_0)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)}\right) + \phi x(1+k)\left(\frac{b_0}{\theta+(1-\theta)b_0}\right)\right].\end{aligned}$$

Taking its derivative with respect to b_0 yields

$$\frac{\partial U_B^E}{\partial b_0} = \frac{1}{2}\theta(1-\theta)(1+k)\left[\frac{(1-x)(1-\phi)k(\theta(1-\phi)+(1-\theta))}{[\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)]^2} - \frac{\phi x\theta}{[\theta+(1-\theta)b_0]^2}\right], \tag{46}$$

The first (positive) term inside the brackets is bounded below for all $b_0 \in [0,1]$ and $\phi > 0$:

$$(1-\phi)\frac{(1-x)k(\theta(1-\phi)+(1-\theta))}{[\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)]^2} \geq (1-\phi)\frac{(1-x)k(1-\theta)}{[\theta(1+k)+(1-\theta)(1+k)]^2}. \tag{47}$$

The magnitude of the second (negative) term is bounded above for all $b_0 \in [0,1]$ and $\phi > 0$: $\frac{\phi x\theta}{[\theta+(1-\theta)b_0]^2} \leq \frac{\phi x}{\theta}$. Moreover,

$$\frac{\partial U_B^E}{\partial b_0}\Big|_{\phi=0} = \frac{1}{2}\theta(1-\theta)(1+k)\left[\frac{(1-x)k}{[\theta(1+k)+(1-\theta)(1+kb_0)]^2}\right] > 0. \tag{48}$$

for all $b_0 \in [0,1]$. Hence, $\frac{\partial U_B^E}{\partial b_0} > 0$ for ϕ sufficiently low. For example, one sufficient upper bound on ϕ would be

$$\frac{\partial U_B^E}{\partial b_0} \geq \frac{1}{2}\theta(1-\theta)(1+k)\left[(1-\phi)\underbrace{\frac{(1-x)k(1-\theta)}{[\theta(1+k)+(1-\theta)(1+k)]^2}}_{\text{call this } H_2} - \phi\frac{x}{\theta}\right] > 0. \tag{49}$$

The last inequality is satisfied if $\phi < \frac{H_2}{H_2+\frac{x}{\theta}} := \underline{\phi}$, where $\underline{\phi} \in (0,1)$. ■

Proof of Proposition 3. Recall that

(50)

$$\begin{aligned}
U_B^E =&\ x\theta - (1-x)\mathbb{E}[T] - \Pi_B \\
=&\ x\theta - (1-x)\frac{1}{2}\theta(1-\theta)(1-\phi)k\left(\frac{(1-b_0)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)}\right) - \phi x\theta(1-\theta)\frac{1}{2}(1+k)\left(\frac{b_0}{\theta+(1-\theta)b_0}\right) \\
=&\ x\theta - \frac{1}{2}\theta(1-\theta)\left[(1-x)(1-\phi)k\left(\frac{(1-b_0)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)}\right) + \phi x(1+k)\left(\frac{b_0}{\theta+(1-\theta)b_0}\right)\right].
\end{aligned}$$

Taking its derivative with respect to b_0 yields

$$\frac{\partial U_B^E}{\partial b_0} = \frac{1}{2}\theta(1-\theta)(1+k)\left[\frac{(1-x)(1-\phi)k(\theta(1-\phi)+(1-\theta))}{[\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)]^2} - \frac{\phi x\theta}{[\theta+(1-\theta)b_0]^2}\right]. \tag{51}$$

As $\phi \to 1$, the first term inside the brackets vanishes, leaving

$$\frac{\partial U_B^E}{\partial b_0}\Bigg|_{\phi=1} = -\frac{1}{2}\theta(1-\theta)(1+k)\left[\frac{x\theta}{[\theta+(1-\theta)b_0]^2}\right] < 0 \tag{52}$$

for all $b_0 \in [0,1]$. Hence, by continuity, for ϕ sufficiently large, $\frac{\partial U_B^E}{\partial b_0} < 0$, implying that the payoff of liquidity-exposed shareholders increases with buyback informativeness. ■

Proof of Corollary 1. When $b_0 = 1$, Lemma 6 implies $\mathbb{E}[T] = 0$. Moreover, Proposition 1 implies that $\Pi_B > \Pi_0$. Hence, $U_B^E\big|_{b_0=1} - U_0^E < 0$ when $\phi > 0$. ■

Proof of Proposition 4. Suppose the manager executes buybacks—buying back x shares—with probabilities b_1 and b_0 upon learning that $A = 1$ and $A = 0$, respectively. Moreover, the speculator buys x shares if and only if he learns that $A = 1$. The proof of Lemma2 shows that the market's pricing rule is given by

$$(53) \qquad P_B(q) = \begin{cases} \frac{\theta(1-\phi)(1-b_1)}{\theta(1-\phi)(1-b_1)+(1-\theta)(1-b_0)} & \text{if } q = -x, \\ \frac{\theta[(1-b_1)+b_1(1-\phi)(1+k)]}{\theta[(1-b_1)+b_1(1-\phi)(1+k)]+(1-\theta)(1+kb_0)} & \text{if } q = 0, \\ \frac{\theta[(1-b_1)\phi+b_1(1+k)]}{\theta[(1-b_1)\phi+b_1(1+k)]+(1-\theta)(1+k)b_0} & \text{if } q = x, \\ 1 & \text{if } q = 2x. \end{cases}$$

Note that for any (b_1, b_0), the equilibrium pricing rule is increasing because of the speculator's informed trading. The manager executes buybacks to maximize $\mathbb{E}[\omega P_B + V]$. As a result, when the manager learns that $A = 1$, she strictly prefers to execute buybacks ($q_B = x$). Doing so increases the expected market-clearing price at $t = 1$ (due to $P_B(q)$ increasing in q) and the per-share value at $t = 2$ (due to trading profits). Hence, $b_1^* = 1$, simplifying the pricing rule:

$$(54) \qquad P_B(q) = \begin{cases} 0 & \text{if } q = -x, \\ \frac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0)} & \text{if } q = 0, \\ \frac{\theta}{\theta+(1-\theta)b_0} & \text{if } q = x, \\ 1 & \text{if } q = 2x, \end{cases}$$

Suppose $b_0^* = 0$. When the manager learns that $A = 0$, she strictly prefers not to execute buybacks if and only if

$$(55) \qquad \underbrace{\tfrac{1}{2}\omega[P_B(0)\big|_{b_0^*=0}]}_{\text{no buyback } (q_B=0)} > \underbrace{\tfrac{1}{2}\omega[P_B(0)\big|_{b_0^*=0} + P_B(x)\big|_{b_0^*=0}] - \tfrac{1}{2}k[P_B(0)\big|_{b_0^*=0} + P_B(x)\big|_{b_0^*=0}]}_{\text{buyback } (q_B=x)},$$

which corresponds to

(56)

$$(\omega - k)P_B(x)\big|_{b_0^*=0} < kP_B(0)\big|_{b_0^*=0} \Leftrightarrow (\omega - k) < k\frac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)} \Leftrightarrow \omega < k\left(1 + \frac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)}\right) := \underline{\omega}.$$

Similarly, suppose $b_0^* = 1$. When the manager learns that $A = 0$, she strictly prefers to execute buybacks if and only if

(57)

$$(\omega - k)P_B(x)\big|_{b_0^*=1} > kP_B(0)\big|_{b_0^*=1} \Leftrightarrow (\omega - k)\theta > k\frac{\theta(1-\phi)}{\theta(1-\phi)+(1-\theta)} \Leftrightarrow \omega > k\left(1 + \frac{(1-\phi)}{\theta(1-\phi)+(1-\theta)}\right) := \bar{\omega}.$$

Note that $\underline{\omega} = k(1 + \frac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)}) < k(1 + \frac{(1-\phi)}{\theta(1-\phi)+(1-\theta)}) = \bar{\omega}$ if and only if

$$(58) \qquad \frac{\theta(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)} < \frac{1}{\theta(1-\phi)+(1-\theta)} \Leftrightarrow 0 < (1-\theta)[1 - \theta\phi(1+k)].$$

Hence, $1 > \theta\phi(1+k)$ ensures that $\underline{\omega} < \bar{\omega}$, and that the manager's execution strategy is unique. Otherwise, we have $\bar{\omega} \leq \underline{\omega}$, and there are multiple equilibria ($b_0^* = 0$ and $b_0^* = 1$) when $\omega \in [\bar{\omega}, \underline{\omega}]$.

Finally, suppose $b_0^* \in (0,1)$. When the manager learns that $A = 0$, she is indifferent between executing buybacks and not executing buybacks if and only if $(\omega - k)P_B(x) = kP_B(0)$, which corresponds to

(59)
$$(\omega - k)\tfrac{1}{\theta+(1-\theta)b_0^*} = k\tfrac{(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)(1+kb_0^*)} \Leftrightarrow b_0^* = \tfrac{(\omega-k)[\theta(1-\phi)(1+k)+(1-\theta)]-\theta k(1-\phi)(1+k)}{(1-\theta)k[(1-\phi)(1+k)-(\omega-k)]}.$$

Note that $b_0^* = 0$ when $\omega = \underline{\omega}$, and $b_0^* = 1$ when $\omega = \bar{\omega}$. Moreover, b_0^* strictly increases with ω on $[\underline{\omega}, \bar{\omega}]$:

(60)
$$\tfrac{\partial b_0^*}{\partial \omega} = \tfrac{(1-\phi)(1+k)[1-\theta\phi(1+k)]}{(1-\theta)k[(1-\phi)(1+k)-(\omega-k)]^2} > 0.$$

■

Proof of Proposition 5. Recall from the proof of Proposition 4 that

(61)
$$\underline{\omega} = k\left(1 + \frac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)}\right) \quad \text{and} \quad \bar{\omega} = k\left(1 + \frac{1-\phi}{\theta(1-\phi)+(1-\theta)}\right)$$

and

(62)
$$b_0^* = \tfrac{(\omega-k)[\theta(1-\phi)(1+k)+(1-\theta)]-\theta k(1-\phi)(1+k)}{(1-\theta)k[(1-\phi)(1+k)-(\omega-k)]}$$

for $\omega \in [\underline{\omega}, \bar{\omega}]$. Note that $\omega \in [\underline{\omega}, \bar{\omega}]$ implies that $\omega > k$ and $\omega < 2k$.

Taking the derivative of $\underline{\omega}$ with respect to θ yields

(63)
$$\frac{\partial \underline{\omega}}{\partial \theta} = \frac{k(1-\phi)(1+k)}{[\theta(1-\phi)(1+k)+(1-\theta)]^2} > 0.$$

Similarly, taking the derivative of $\bar{\omega}$ with respect to θ yields

(64)
$$\frac{\partial \bar{\omega}}{\partial \theta} = \frac{k(1-\phi)\phi}{[\theta(1-\phi)+(1-\theta)]^2} > 0.$$

Moreover, the expression for b_0^* can be rearranged as

(65)
$$b_0^* = -\tfrac{(2k-\omega)(1-\phi)(1+k)}{k[(1-\phi)(1+k)-(\omega-k)]}\frac{\theta}{1-\theta} + \tfrac{\omega-k}{k[(1-\phi)(1+k)-(\omega-k)]},$$

which decreases in θ. Hence, for any fixed ω, higher θ implies lower b_0^* (i.e., higher buyback informativeness).

Taking the derivative of $\underline{\omega}$ with respect to k yields

(66)
$$\frac{\partial \underline{\omega}}{\partial k} = 1 + \tfrac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)} + \tfrac{k\theta(1-\theta)(1-\phi)}{[\theta(1-\phi)(1+k)+(1-\theta)]^2} > 0.$$

Taking the derivative of $\bar{\omega}$ with respect to k yields

$$\frac{\partial \bar{\omega}}{\partial k} = \left(1 + \frac{1-\phi}{\theta(1-\phi)+(1-\theta)}\right) > 0. \tag{67}$$

Moreover, the expression for b_0^* can be rearranged as

$$b_0^* = \frac{(\omega-k)(1-\theta)-(2k-\omega)\theta(1-\phi)(1+k)}{(1-\theta)k[(1-\phi)(1+k)-\omega+k]}, \tag{68}$$

which decreases in k, which enters negatively in the numerator and positively in the denominator. Hence, for any fixed ω, higher k implies lower b_0^* (i.e., higher buyback informativeness).

Taking the derivative of $\underline{\omega}$ with respect to ϕ yields

$$\frac{\partial \underline{\omega}}{\partial \phi} = -\frac{k\theta(1+k)(1-\theta)}{[\theta(1-\phi)(1+k)+(1-\theta)]^2} < 0. \tag{69}$$

Taking the derivative of $\bar{\omega}$ with respect to ϕ yields

$$\frac{\partial \bar{\omega}}{\partial \phi} = -\frac{k(1-\theta)}{[\theta(1-\phi)+(1-\theta)]^2} < 0. \tag{70}$$

Moreover, the expression for b_0^* can be rearranged as

$$b_0^* = \frac{(\omega-k)(1-\theta)-\theta(1+k)(2k-\omega)+\phi\theta(1+k)(2k-\omega)}{(1-\theta)k(1+k)-(1-\theta)k(\omega-k)-\phi(1-\theta)k(1+k)}, \tag{71}$$

which increases in ϕ because ϕ enters positively in the numerator and negatively in the denominator. Hence, for any fixed ω, higher ϕ implies higher b_0^* (i.e., lower buyback informativeness). ■

B Proofs: Extensions

Proof of Lemma 7. Recall that

$$P_B^D(q) = \begin{cases} 0 & \text{if } q=-x, \\ \frac{\theta_x(1-\phi)}{\theta_x(1-\phi)+(1-\theta_x)} & \text{if } q=0, \\ \theta_x & \text{if } q=x, \\ 1 & \text{if } q=2x, \end{cases} \tag{72}$$

Hence, the expected per-share profit generated by the buyback program is

(73)

$$\begin{aligned}\mathbb{E}[T^D] =& \; \theta\tfrac{1}{2}k\phi[1-P_B^D(x)] + \theta\tfrac{1}{2}k(1-\phi)[1-P_B^D(0)+1-P_B^D(x)] + (1-\theta)b_0\tfrac{1}{2}k[-P_B^D(0)-P_B^D(x)] \\ =& \; \tfrac{1}{2}k\underbrace{\left[\theta-(\theta+(1-\theta)b_0)\theta_x\right]}_{=0} + \tfrac{1}{2}k\underbrace{\left[\theta(1-\phi)\tfrac{(1-\theta_x)}{\theta_x(1-\phi)+(1-\theta)} - (1-\theta)b_0\tfrac{\theta_x(1-\phi)}{\theta_x(1-\phi)+(1-\theta_x)}\right]}_{=0} = 0,\end{aligned}$$

noting that $\theta_x = \frac{\theta}{\theta+(1-\theta)b_0} \Leftrightarrow \theta_x(1-\theta)b_0 = \theta(1-\theta_x)$. ■

Proof of Proposition 6. Given the pricing rule P_B^D, the expected trading profit of the speculator is

$$\Pi_B^D = x\phi\theta\tfrac{1}{2}(1+k)\left[1-P_B^D(x)\right] = x\phi\theta(1-\theta)\tfrac{1}{2}\left(\tfrac{(1+k)b_0}{\theta+(1-\theta)b_0}\right), \tag{74}$$

which strictly increases with b_0:

$$\frac{\partial\Pi_B^D}{\partial b_0} = \tfrac{1}{2}\left(\tfrac{x\phi\theta(1-\theta)(1+k)\theta}{[\theta+(1-\theta)b_0]^2}\right) > 0. \tag{75}$$

Moreover, $\Pi_B^D\big|_{b=0} < \Pi_0$ and $\Pi_B^D\big|_{b_0=1} > \Pi_0$, implying that there exists a threshold $\bar{b}_0^D$ such that $\Pi_B^D < \Pi_0 \Leftrightarrow b_0 < \bar{b}_0^D$. ■

Proof of Proposition 7. This proof closely follows the logic of the proof of Proposition 4. First, executing buybacks when $A=1$ increases the expected market-clearing price at $t=1$, strictly so if $b_0<1$. Moreover, these buybacks also generate positive trading profits if $b_0>0$. Hence, executing buybacks upon learning that $A=1$ is strictly dominant: $b_1^*=1$.

Second, the manager faces a trade-off upon observing $A=0$. If she does not execute, the lack of pre-trade disclosure fully reveals that $A=0$, implying that the market-clearing stock price at $t=1$ and the per-share value at $t=2$ are zero. If she does execute, the expected market-clearing price is $\frac{1}{2}\left(P_B^D(0)+P_B^D(x)\right)>0$. In this case, she prefers not to execute buybacks if and only if

$$0 \geq \omega\tfrac{1}{2}\left(P_B^D(0)+P_B^D(x)\right) - k\tfrac{1}{2}\left(P_B^D(0)+P_B^D(x)\right) \Leftrightarrow (\omega-k)\leq 0 \Leftrightarrow \omega\leq k. \tag{76}$$

She strictly prefers to execute buybacks if and only if

$$0 < \omega\tfrac{1}{2}\left(P_B^D(0)+P_B^D(x)\right) - k\tfrac{1}{2}\left(P_B^D(0)+P_B^D(x)\right) \Leftrightarrow (\omega-k) > 0 \Leftrightarrow \omega > k. \tag{77}$$

Recall that in the baseline model, the threshold $\underline{\omega}$ is

$$\underline{\omega} = k\left(1+\tfrac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)}\right) > k. \tag{78}$$

Hence, for all ω, the manager is more likely to buy back shares in the low-fundamental state in the pre-trade disclosure regime than in the baseline without disclosure. ■

Proof of Lemma 8. Recall that the market's posterior beliefs are

$$\hat{\theta}_B(q) = \begin{cases} \frac{\theta(1-b_1)(1-\phi)}{\theta(1-b_1)(1-\phi)+(1-\theta)(1-b_0)} & \text{if } q=-x, \\ \frac{\theta(1-b_1\phi)}{\theta(1-b_1\phi)+(1-\theta)} & \text{if } q=0, \\ \frac{\theta(\phi+(1-\phi)b_1)}{\theta(\phi+(1-\phi)b_1)+(1-\theta)b_0} & \text{if } q=x, \\ 1 & \text{if } q=2x, \end{cases} \tag{79}$$

and

$$\Delta\hat{\theta}_B = \tfrac{1}{2}[(1-b_0)-(1-\phi)(1-b_1)](\hat{\theta}_B(x)-\hat{\theta}_B(-x)) + \tfrac{1}{2}\phi b_1(1-\hat{\theta}_B(0)). \tag{80}$$

Taking the derivative of $\hat{\theta}_B(-x)$, $\hat{\theta}_B(0)$, and $\hat{\theta}_B(x)$ with respect to b_1 yields

(81)
$$\frac{\partial \hat{\theta}_B(-x)}{\partial b_1} = -\frac{\theta(1-\phi)(1-\theta)(1-b_0)}{[\theta(1-b_1)(1-\phi)+(1-\theta)(1-b_0)]^2} < 0,$$

(82)
$$\frac{\partial \hat{\theta}_B(0)}{\partial b_1} = -\frac{\theta\phi(1-\theta)}{[\theta(1-b_1\phi)+(1-\theta)]^2} < 0$$

and

(83)
$$\frac{\partial \hat{\theta}_B(x)}{\partial b_1} = \frac{\theta(1-\phi)(1-\theta)b_0}{[\theta(\phi+(1-\phi)b_1)+(1-\theta)b_0]^2} > 0.$$

Hence,

(84)
$$\frac{\partial \Delta\hat{\theta}_B}{\partial b_1} = \frac{1}{2}\left[\underbrace{\left((b_1-b_0)+\phi(1-b_1)\right)}_{>0 \text{ because } b_1 \geq b_0}\underbrace{\frac{\partial(\hat{\theta}_B(x)-\hat{\theta}_B(-x))}{\partial b_1}}_{>0} + (1-\phi)(\hat{\theta}_B(x)-\hat{\theta}_B(-x)) + \phi(1-\hat{\theta}_B(0)) - \phi b_1 \underbrace{\frac{\partial \hat{\theta}_B(0)}{\partial b_1}}_{<0}\right] > 0.$$

Taking the derivative of $\hat{\theta}_B(-x)$, $\hat{\theta}_B(0)$, and $\hat{\theta}_B(x)$ with respect to b_0 yields

(85)
$$\frac{\partial \hat{\theta}_B(-x)}{\partial b_0} = \frac{\theta(1-b_1)(1-\phi)(1-\theta)}{[\theta(1-b_1)(1-\phi)+(1-\theta)(1-b_0)]^2} > 0,$$

(86)
$$\frac{\partial \hat{\theta}_B(0)}{\partial b_0} = 0$$

and

(87)
$$\frac{\partial \hat{\theta}_B(x)}{\partial b_0} = -\frac{\theta(\phi+(1-\phi)b_1)(1-\theta)}{[\theta(\phi+(1-\phi)b_1)+(1-\theta)b_0]^2} < 0.$$

Hence,

(88)
$$\frac{\partial \Delta\hat{\theta}_B}{\partial b_0} = \frac{1}{2}\left[\underbrace{\left((b_1-b_0)+\phi(1-b_1)\right)}_{>0}\underbrace{\frac{\partial(\hat{\theta}_B(x)-\hat{\theta}_B(-x))}{\partial b_0}}_{<0} - (\hat{\theta}_B(x)-\hat{\theta}_B(-x)) - \phi b_1 \underbrace{\frac{\partial \hat{\theta}_B(0)}{\partial b_0}}_{=0}\right] < 0.$$

Recall that $\Delta\hat{\theta}_0 = \frac{1}{2}\phi\frac{(1-\theta)}{\theta(1-\phi)+(1-\theta)}$. Fix $b_0 < 1$ and note that

(89)
$$\Delta\hat{\theta}_B\big|_{b_1=1} = \frac{1}{2}(1-b_0)\frac{\theta\phi}{\theta\phi+(1-\theta)} + \frac{1}{2}\phi\frac{(1-\theta)}{\theta(1-\phi)+(1-\theta)} > \Delta\hat{\theta}_0$$

and

(90)
$$\Delta\hat{\theta}_B\big|_{b_1=b_0=b>0} = \frac{1}{2}\phi(1-b)\underbrace{\left[\frac{\theta(\phi+(1-\phi)b)}{\theta(\phi+(1-\phi)b)+(1-\theta)b} - \frac{\theta(1-\phi)}{\theta(1-\phi)+(1-\theta)}\right]}_{<\frac{(1-\theta)}{\theta(1-\phi)+(1-\theta)}} + \frac{1}{2}\phi b\underbrace{\frac{(1-\theta)}{\theta((1-\phi)+\phi(1-b))+(1-\theta)}}_{<\frac{(1-\theta)}{\theta(1-\phi)+(1-\theta)}} < \Delta\hat{\theta}_0.$$

Hence, the monotonicity of $\Delta\hat{\theta}_B$ with respect to b_1 implies that there exists some $\underline{b}_1(b_0) \in (b_0, 1)$

such that $\Delta\hat{\theta}_B > \Delta\hat{\theta}_0 \Leftrightarrow b_1 > \underline{b}_1(b_0)$. For completeness, note that $b_1 = b_0 = 1$ implies that $\Delta\hat{\theta}_B = \Delta\hat{\theta}_0$, implying that $\underline{b}_1(1) = 1$.

Fix $b_1 > 0$. Note that

$$(91)\qquad \Delta\hat{\theta}_B\big|_{b_0=0} = \frac{1}{2}\underbrace{[\phi+(1-\phi)b_1]}_{>\phi}\underbrace{\frac{1-\theta}{\theta(1-\phi)(1-b_1)+(1-\theta)}}_{>\frac{(1-\theta)}{\theta(1-\phi)+(1-\theta)}}+\frac{1}{2}\phi b_1\frac{1-\theta}{\theta(1-\phi+\phi(1-b_1))+(1-\theta)} > \Delta\hat{\theta}_0$$

and $\Delta\hat{\theta}_B\big|_{b_0=b_1=b} < \Delta\hat{\theta}_0$. Hence, the monotonicity of $\Delta\hat{\theta}_B$ with respect to b_0 implies that there exists some $\underline{b}_0(b_1) \in (0, b_1)$ such that $\Delta\hat{\theta}_B > \Delta\hat{\theta}_0 \Leftrightarrow b_0 < \underline{b}_0(b_1)$. ■

Proof of Lemma 9. Recall that

$$(92)\qquad \Delta V_B = \mathbb{E}[V_B|A=1] - \mathbb{E}[V_B|A=0] = \Delta V_0 + b_1\bar{T}_G + b_0\bar{T}_L,$$

where

$$(93)\quad \bar{T}_G = \frac{1}{2}k\left[(1-\phi)\underbrace{\left(\frac{(1-\theta)(1+kb_0)}{\theta((1-b_1)+b_1(1-\phi)(1+k))+(1-\theta)(1+kb_0)}\right)}_{1-P_B(0)} + \underbrace{\frac{(1-\theta)(1+k)b_0}{\theta((1-b_1)\phi+b_1(1+k))+(1-\theta)(1+k)b_0}}_{1-P_B(x)}\right]$$

and

$$(94)\qquad \bar{T}_L = \frac{1}{2}k\left[\underbrace{\frac{\theta((1-b_1)+b_1(1-\phi)(1+k))}{\theta((1-b_1)+b_1(1-\phi)(1+k))+(1-\theta)(1+kb_0)}}_{P_B(0)} + \underbrace{\frac{\theta((1-b_1)\phi+b_1(1+k))}{\theta((1-b_1)\phi+b_1(1+k))+(1-\theta)(1+k)b_0}}_{P_B(x)}\right].$$

Taking the derivative of $\bar{T}_G$ and $\bar{T}_L$ with respect to b_0 yields

$$(95)\quad \frac{\partial\bar{T}_G}{\partial b_0} = \frac{1}{2}k\left[(1-\phi)\left(\frac{(1-\theta)k\theta((1-b_1)+b_1(1-\phi)(1+k))}{[\theta((1-b_1)+b_1(1-\phi)(1+k))+(1-\theta)(1+kb_0)]^2}\right) + \frac{(1-\theta)(1+k)\theta((1-b_1)\phi+b_1(1+k))}{[\theta((1-b_1)\phi+b_1(1+k))+(1-\theta)(1+k)b_0]^2}\right] > 0$$

and

$$(96)\quad \begin{aligned}\frac{\partial\bar{T}_L}{\partial b_0} &= \frac{1}{2}k\left[-\frac{(1-\theta)k\theta((1-b_1)+b_1(1-\phi)(1+k))}{[\theta((1-b_1)+b_1(1-\phi)(1+k))+(1-\theta)(1+kb_0)]^2} - \frac{(1-\theta)(1+k)\theta((1-b_1)\phi+b_1(1+k))}{[\theta((1-b_1)\phi+b_1(1+k))+(1-\theta)(1+k)b_0]^2}\right]\\ &= \frac{1}{2}k\left[-P_B(0)\frac{(1-\theta)k}{\theta((1-b_1)+b_1(1-\phi)(1+k))+(1-\theta)(1+kb_0)} - P_B(x)\frac{(1-\theta)(1+k)}{\theta((1-b_1)\phi+b_1(1+k))+(1-\theta)(1+k)b_0}\right] < 0.\end{aligned}$$

Note that $\bar{T}_L + b_0\frac{\partial\bar{T}_L}{\partial b_0}$ simplifies to

$$(97)\quad \frac{1}{2}k\left[P_B(0)\underbrace{\left(1-\frac{(1-\theta)kb_0}{\theta((1-b_1)+b_1(1-\phi)(1+k))+(1-\theta)(1+kb_0)}\right)}_{>0} + P_B(x)\underbrace{\left(1-\frac{(1-\theta)(1+k)b_0}{\theta((1-b_1)\phi+b_1(1+k))+(1-\theta)(1+k)b_0}\right)}_{>0}\right] > 0.$$

Hence,

$$\frac{\partial \Delta V_B}{\partial b_0} = \bar{T}_L + b_0 \frac{\partial \bar{T}_L}{\partial b_0} + b_1 \frac{\partial \bar{T}_G}{\partial b_0} > 0. \tag{98}$$

Taking the derivative of $\bar{T}_G$ with respect to b_1 yields

(99)

$$\begin{aligned} \frac{\partial \bar{T}_G}{\partial b_1} = & \ \frac{1}{2}k\left[(1-\phi)\left(\frac{\theta(1-(1-\phi)(1+k))(1-\theta)(1+kb_0)}{[\theta((1-b_1)+b_1(1-\phi)(1+k))+(1-\theta)(1+kb_0)]^2}\right) - \frac{\theta(1+k-\phi)(1-\theta)(1+k)b_0}{[\theta((1-b_1)\phi+b_1(1+k))+(1-\theta)(1+k)b_0]^2}\right] \\ = & \ \frac{1}{2}k\left[(1-\phi)\left(\frac{(1-P_B(0))\theta(1-(1-\phi)(1+k))}{\theta((1-b_1)+b_1(1-\phi)(1+k))+(1-\theta)(1+kb_0)}\right) - \frac{(1-P_B(x))\theta(1+k-\phi)}{\theta((1-b_1)\phi+b_1(1+k))+(1-\theta)(1+k)b_0}\right]. \end{aligned}$$

Note that $\bar{T}_G + b_1 \frac{\partial \bar{T}_G}{\partial b_1}$ simplifies to

(100)

$$\frac{1}{2}k\left[(1-P_B(0))\left(\frac{(1-\phi)[\theta+(1-\theta)(1+kb_0)]}{\theta[(1-b_1)+b_1(1-\phi)(1+k)]+(1-\theta)(1+kb_0)}\right) + (1-P_B(x))\left(\frac{\theta\phi+(1-\theta)(1+k)b_0}{\theta[(1-b_1)\phi+b_1(1+k)]+(1-\theta)(1+k)b_0}\right)\right] > 0.$$

Taking the derivative of $\bar{T}_L$ with respect to b_1 yields

$$\frac{\partial \bar{T}_L}{\partial b_1} = \frac{1}{2}k\left[\frac{\theta(1-\theta)(1+kb_0)(-1+(1-\phi)(1+k))}{[\theta((1-b_1)+b_1(1-\phi)(1+k))+(1-\theta)(1+kb_0)]^2} + \frac{[1+k-\phi]\theta(1-\theta)(1+k)b_0}{[\theta((1-b_1)\phi+b_1(1+k))+(1-\theta)(1+k)b_0]^2}\right], \tag{101}$$

which is bounded for all $b_0 \in [0,1]$. Hence, $\frac{\partial \Delta V_B}{\partial b_1}\big|_{b_0=0} > 0$, implying that value dispersion increases with b_1 when b_0 is sufficiently small. ■

Proof of Proposition 8. Recall from the proof of Lemma 2 that when the manager follows the buyback strategy (b_1, b_0) and the speculator buys if and only if he observes $A=1$, the distribution of the order flow is

State	Firm (q_B)	Speculator (q_S)	Probability	Order Flow			
$A=0$	0	0	$(1-\theta)(1-b_0)$	-x	0		
$A=0$	x	0	$(1-\theta)b_0$		0	x	
$A=1$	0	0	$\theta(1-\phi)(1-b_1)$	-x	0		
$A=1$	x	0	$\theta(1-\phi)b_1$		0	x	
$A=1$	0	x	$\theta\phi(1-b_1)$		0	x	
$A=1$	x	x	$\theta\phi b_1$			x	2x

and the equilibrium pricing rule is

$$P_B(q) = \begin{cases} \frac{\theta(1-\phi)(1-b_1)}{\theta(1-\phi)(1-b_1)+(1-\theta)(1-b_0)} & \text{if } q=-x, \\ \frac{\theta[(1-b_1)+b_1(1-\phi)(1+k)]}{\theta[(1-b_1)+b_1(1-\phi)(1+k)]+(1-\theta)(1+kb_0)} & \text{if } q=0, \\ \frac{\theta[(1-b_1)\phi+b_1(1+k)]}{\theta[(1-b_1)\phi+b_1(1+k)]+(1-\theta)(1+k)b_0} & \text{if } q=x, \\ 1 & \text{if } q=2x, \end{cases} \tag{102}$$

The speculator's expected trading profit is

(103)

$$\begin{aligned}\Pi_B = {} & x\phi\theta(1-b_1)\tfrac{1}{2}\big(1-P_B(0)+1-P_B(x)\big)+x\phi\theta b_1\tfrac{1}{2}(1+k)\big(1-P_B(x)\big)\\ = {} & x\phi\theta(1-\theta)\tfrac{1}{2}\left[\tfrac{(1-b_1)(1+b_0k)}{\theta[(1-b_1)+b_1(1-\phi)(1+k)]+(1-\theta)(1+b_0k)}+\tfrac{(1+b_1k)(1+k)b_0}{\theta[(1-b_1)\phi+b_1(1+k)]+(1-\theta)(1+k)b_0}\right].\end{aligned}$$

For algebraic convenience, let us split Π_B into its two addends: $\Pi_B = \Pi_{B1} + \Pi_{B2}$, where

(104) $$\Pi_{B1} = x\phi\theta(1-\theta)\tfrac{1}{2}\left[\tfrac{(1-b_1)(1+b_0k)}{\theta[(1-b_1)+b_1(1-\phi)(1+k)]+(1-\theta)(1+b_0k)}\right]$$

and

(105) $$\Pi_{B2} = x\phi\theta(1-\theta)\tfrac{1}{2}\left[\tfrac{(1+b_1k)(1+k)b_0}{\theta[(1-b_1)\phi+b_1(1+k)]+(1-\theta)(1+k)b_0}\right].$$

Note that

(106) $$\tfrac{\partial\Pi_{B1}}{\partial b_0} = \theta(1-\theta)\phi\frac{x}{2}\tfrac{(1-b_1)k\theta(1-b_1+b_1(1-\phi)(1+k))}{[\theta[(1-b_1)+b_1(1-\phi)(1+k)]+(1-\theta)(1+b_0k)]^2} > 0$$

and

(107) $$\tfrac{\partial\Pi_{B2}}{\partial b_0} = x\phi\theta(1-\theta)\tfrac{1}{2}\tfrac{(1+b_1k)(1+k)\theta((1-b_1)\phi+b_1(1+k))}{[\theta[(1-b_1)\phi+b_1(1+k)]+(1-\theta)(1+k)b_0]^2} > 0,$$

implying that $\frac{\partial\Pi_B}{\partial b_0} > 0$. Note that

(108) $$\tfrac{\partial\Pi_{B1}}{\partial b_1} = -x\phi\theta(1-\theta)\tfrac{1}{2}\tfrac{(1+b_0k)(\theta(1-\phi)(1+k)+(1-\theta)(1+b_0k))}{[\theta[(1-b_1)+b_1(1-\phi)(1+k)]+(1-\theta)(1+b_0k)]^2} < 0,$$

and is bounded above by

(109) $$B_1 = -x\phi\theta(1-\theta)\tfrac{1}{2}\tfrac{(1-\theta)(1+b_0k)^2}{[\theta[(1-b_1)+b_1(1+k)]+(1-\theta)(1+b_0k)]^2}.$$

Moreover,

(110) $$\tfrac{\partial\Pi_{B2}}{\partial b_1} = x\phi\theta(1-\theta)\tfrac{1}{2}\tfrac{(1+k)^2b_0(k(1-\theta)b_0-\theta(1-\phi))}{[\theta[(1-b_1)\phi+b_1(1+k)]+(1-\theta)(1+k)b_0]^2},$$

which is bounded above by

(111) $$B_2 = x\phi\theta(1-\theta)\tfrac{1}{2}\tfrac{(1+k)^2b_0(k(1-\theta)b_0)}{[\theta b_1(1+k)+(1-\theta)(1+k)b_0]^2} = x\phi\theta(1-\theta)\tfrac{1}{2}\tfrac{b_0(k(1-\theta)b_0)}{[\theta b_1+(1-\theta)b_0]^2}.$$

Hence,

(112) $$\tfrac{\partial\Pi_B}{\partial b_1} = \tfrac{\partial\Pi_{B1}}{\partial b_1} + \tfrac{\partial\Pi_{B2}}{\partial b_1} \le B_1 + B_2$$

and note that

$$(113)\qquad B_1+B_2 = x\phi\theta\frac{1}{2}\left[-\frac{(1-\theta)^2(1+b_0k)^2}{[\theta[(1-b_1)+b_1(1+k)]+(1-\theta)(1+b_0k)]^2}+\frac{k(1-\theta)^2b_0^2}{[\theta b_1+(1-\theta)b_0]^2}\right],$$

which is negative whenever

$$(114)\qquad \frac{1+b_0k}{\theta[(1-b_1)+b_1(1+k)]+(1-\theta)(1+b_0k)} > \sqrt{k}\left(\frac{b_0}{\theta b_1+(1-\theta)b_0}\right).$$

Note that $\sqrt{k}<1$ because $k<1$ and

$$(115)\qquad \frac{1+b_0k}{\theta[(1-b_1)+b_1(1+k)]+(1-\theta)(1+b_0k)} > \frac{b_0}{\theta b_1+(1-\theta)b_0}$$

whenever $b_1 \geq b_0$. Hence, we have $\frac{\partial \Pi_B}{\partial b_1}<0$ whenever $k<1$ and $b_1\geq b_0$.

When buybacks are uninformed ($b_1=b_0=b$), the speculator's expected trading profit is

$$(116)\qquad \Pi_B = \frac{\theta(1-\theta)x\phi}{2}\left[\frac{(1-b)(1+bk)}{\theta[(1-b)+b(1-\phi)(1+k)]+(1-\theta)(1+bk)}+\frac{(1+bk)(1+k)b}{\theta[(1-b)\phi+b(1+k)]+(1-\theta)(1+k)b}\right].$$

In this case,

(117)

$$\begin{aligned}\Pi_B-\Pi_0 &= \frac{\theta(1-\theta)x\phi}{2}\left[\frac{(1-b)(1+bk)}{\theta[(1-b)+b(1-\phi)(1+k)]+(1-\theta)(1+bk)}+\frac{(1+bk)(1+k)b}{\theta[(1-b)\phi+b(1+k)]+(1-\theta)(1+k)b}-1\right]\\ &= \frac{\theta(1-\theta)x\phi}{2}\left[(1-b)\left(\frac{(1+bk)}{\theta[(1-b)+b(1-\phi)(1+k)]+(1-\theta)(1+bk)}-1\right)+b\left(\frac{(1+bk)(1+k)}{\theta[(1-b)\phi+b(1+k)]+(1-\theta)(1+k)b}-1\right)\right]\\ &= \frac{\theta(1-\theta)x\phi}{2}\left[\underbrace{\left(\frac{\theta\phi(1+k)b(1-b)}{\theta[(1-b)+b(1-\phi)(1+k)]+(1-\theta)(1+bk)}\right)}_{>0}+\underbrace{\left(\frac{b[\theta(1+k-\phi)(1-b)+(1-\theta)(1+k)(1-b)+k(1+k)b]}{\theta[(1-b)\phi+b(1+k)]+(1-\theta)(1+k)b}\right)}_{>0}\right]>0.\end{aligned}$$

In addition, note that for a fixed $b_1>0$,

$$(118)\qquad \Pi_B\Big|_{b_0=0} = x\phi\theta(1-\theta)\frac{1}{2}\left[\frac{(1-b_1)}{\theta[(1-b_1)+b_1(1-\phi)(1+k)]+(1-\theta)}\right]<\Pi_0,$$

and for a fixed $b_0<\bar{b}_0$, with $\bar{b}_0$ defined in Proposition 1, $\Pi_B\big|_{b_1=1}<\Pi_0$. The monotonicity of Π_B with respect to b_0 and b_1 (when $k<1$) establishes the claim of the proposition. ■

C Additional Results and Robustness

C.A Other Trading Outcomes

The competition and dispersion effects of a stock buyback program also affect the distribution of the firm's stock return from $t=1$ to $t=2$. In the benchmark without buybacks, the firm's stock return from $t=1$ to $t=2$ is $r_0=\frac{A-P_0}{P_0}$, where P_0 is the firm's market-clearing price at $t=1$

described by Lemma 1. With buybacks, the firm's stock return becomes $r_B = \frac{V-P_B}{P_B}$, where P_B is the firm's market-clearing stock price at $t = 1$ described by Lemma 2 and V is the firm's per-share value at $t = 2$.

C.A.1 Return Volatility

If the execution of the buyback program is informed ($b_0 < 1$), then the competition effect increases the informativeness of the order flow. As a result, the firm's market-clearing price at $t = 1$ is more likely to reflect its fundamentals. Hence, the competition effect of informed buybacks tends to push the distribution of the firm's stock return toward the expectation, decreasing the volatility of returns.

The dispersion effect works in the opposite direction through buyback trading gains and losses. When the firm's fundamentals are high, buybacks generate trading profits that increase the firm's $t = 2$ per-share value and the realized stock return. When the firm's fundamentals are low, buybacks generate trading losses that decrease the firm's $t = 2$ per-share value and the realized stock return. Thus, the dispersion effect of buybacks tends to shift the distribution of the firm's stock return away from the expectation, increasing the volatility of returns.

The overall impact of a buyback program on the volatility of the firm's stock return depends on the relative magnitude of these effects. The first effect dominates when the execution of the buyback program is sufficiently informed. Otherwise, the second effect dominates.

Proposition C.1. *A stock buyback program decreases the volatility of the firm's stock return from $t = 1$ to $t = 2$ if and only if its execution is sufficiently informed: $\exists \bar{b}_0^r \in (0,1)$ such that $Var(r_B) < Var(r_0) \Leftrightarrow b_0 < \bar{b}_0^r$.*

Proof of Proposition C.1. Because the market is risk-neutral and does not discount for time, the break-even condition implies that the market-clearing price at $t = 1$ is set so that the expected stock return from $t = 1$ to $t = 2$ is 0. In the benchmark without a stock buyback program, Lemma 1 implies that the volatility of the firm's stock return is

$$\begin{aligned} Var(r_0) =\ & \tfrac{1}{2}(1-\theta)\left(\tfrac{0-P_0(-x)}{P_0(-x)}-0\right)^2 + \tfrac{1}{2}(1-\theta)\left(\tfrac{0-P_0(0)}{P_0(0)}-0\right)^2 \\ & + \tfrac{1}{2}\theta(1-\phi)\left(\tfrac{1-P_0(-x)}{P_0(-x)}-0\right)^2 + \tfrac{1}{2}\theta\left(\tfrac{1-P_0(0)}{P_0(0)}-0\right)^2 + \tfrac{1}{2}\theta\phi\left(\tfrac{1-P_0(x)}{P_0(x)}-0\right)^2 \\ =\ & (1-\theta) + \frac{1}{2}\frac{(1-\theta)^2}{\theta(1-\phi)} + \frac{1}{2}\frac{(1-\theta)^2}{\theta}. \end{aligned}$$

Recall from Lemma 2 that the equilibrium order flow with buybacks is

State	Firm (q_B)	Speculator (q_S)	Probability	Order Flow	
$A=0$	0	0	$(1-\theta)(1-b_0)$	-x	0
$A=0$	x	0	$(1-\theta)b_0$	0	x
$A=1$	x	0	$\theta(1-\phi)$	0	x
$A=1$	x	x	$\theta\phi$	x	2x

Moreover, the order flow is fully revealing when $q = -x$ and $q = 2x$, implying that the realized return in those states is 0. Hence, the volatility of the firm's stock return is

$$\begin{aligned}
Var(r_B) = &\ \tfrac{1}{2}(1-\theta)(1-b_0)\left(\tfrac{0-P_B(0)}{P_B(0)}\right)^2 + \tfrac{1}{2}(1-\theta)b_0\left(\tfrac{-(1+k)P_B(0)}{P_B(0)}\right)^2 + \tfrac{1}{2}(1-\theta)b_0\left(\tfrac{-(1+k)P_B(x)}{P_B(x)}\right)^2 \\
&+ \tfrac{1}{2}\theta(1-\phi)\left(\tfrac{(1+k)(1-P_B(0))}{P_B(0)}\right)^2 + \tfrac{1}{2}\theta\left(\tfrac{(1+k)(1-P_B(x))}{P_B(x)}\right)^2 \\
= &\ \tfrac{1}{2}(1-\theta)(1-b_0) + (1-\theta)b_0(1+k)^2 + \tfrac{1}{2}\tfrac{(1-\theta)^2(1+kb_0)^2}{\theta(1-\phi)} + \tfrac{1}{2}(1+k)^2\tfrac{(1-\theta)^2 b_0^2}{\theta}.
\end{aligned}$$

Note that $\frac{dVar(r_B)}{db_0} > 0$ and

$$Var(r_B)\big|_{b_0=1} = (1-\theta)(1+k)^2 + \tfrac{1}{2}\tfrac{(1-\theta)^2(1+k)^2}{\theta(1-\phi)} + \tfrac{1}{2}(1+k)^2\tfrac{(1-\theta)^2}{\theta} > Var(r_0)$$

and

$$Var(r_B)\big|_{b_0=0} = \frac{1}{2}(1-\theta) + \frac{1}{2}\frac{(1-\theta)^2}{\theta(1-\phi)} < Var(r_0).$$

Hence, the monotonicity of $Var(r_B)$ with respect to b_0 implies that there exists a $\bar{b}_0^r \in (0,1)$ such that $Var(r_B) < Var(r_0) \Leftrightarrow b_0 < \bar{b}_0^r$. ■

C.A.2 Return Following Buybacks

The informativeness of buybacks also influences the firm's expected stock return from $t=1$ to $t=2$ following buybacks. When buybacks are more informed, a buyback is more likely to occur when fundamentals are high. Conditional on a buyback occurring, then, higher informativeness implies that fundamentals are more likely to be high—leading to higher prices at $t=2$ once fundamentals become public. In addition, more informed buybacks are more likely to earn trading profits, which further increase the firm's per-share value at $t=2$. More informative buybacks also increase the firm's stock price at $t=1$. However, because the order flow at $t=1$ is not fully revealing, the firm's per-share value at $t=2$ following buybacks increases relative to its stock price at $t=1$.

Proposition C.2. *If the execution of the stock buyback program is informed ($b_0 < 1$), then the expected return of the firm's stock from $t=1$ to $t=2$ following buybacks is positive and decreases in b_0.*

Proposition C.2 predicts a positive association between the informativeness of buybacks and subsequent returns, consistent with the empirical findings of Bonaime and Ryngaert (2013), who document higher stock returns following buybacks when the firm's insiders and the buyback program trade in the same direction.

Proof of Proposition C.2. Lemma 2 implies that the firm's conditional expected return following buybacks is

$$\begin{aligned}
E[r_B|q_B = x] = &\ \tfrac{(1-\theta)b_0}{\theta+(1-\theta)b_0}(-(1+k)) + \tfrac{1}{2}\tfrac{\theta(1-\phi)}{\theta+(1-\theta)b_0}\tfrac{(1+k)(1-P_B(0))}{P_B(0)} + \tfrac{1}{2}\tfrac{\theta}{\theta+(1-\theta)b_0}\tfrac{(1+k)(1-P_B(x))}{P_B(x)} \\
= &\ \tfrac{1}{2}\tfrac{(1-\theta)(1-b_0)}{\theta+(1-\theta)b_0} > 0,
\end{aligned}$$

when buybacks are informed ($b_0 < 1$), noting that the realized return when the order flow is fully revealing (i.e., $q = -x$, $q = 2x$) is 0. Taking the derivative of $E[r_B|q_B = x]$ with respect to b_0 yields

$$\frac{\partial E[r_B|q_B = x]}{\partial b_0} = \frac{1}{2}(1-\theta)\left(-\frac{1}{(\theta+(1-\theta)b_0)^2}\right) < 0.$$

■

C.B Short Selling

For simplicity, the baseline model assumes that the speculator cannot sell short. This analysis relaxes this assumption, allowing the speculator to submit an order $q_S \in \{-x, 0, x\}$, and demonstrates that the framework's main conclusion—that uninformed buybacks hurt shareholders— extends to this setting.[27]

The following lemma characterizes the benchmark trading equilibrium featuring short selling.

Lemma C.1. *In the absence of a buyback program, the equilibrium pricing rule is*

$$P_0^S(q) = \begin{cases} 0 & \text{if } q = -2x, \\ \frac{\theta(1-\phi)}{\theta(1-\phi)+(1-\theta)} & \text{if } q = -x, \\ \frac{\theta}{\theta+(1-\theta)(1-\phi)} & \text{if } q = 0, \\ 1 & \text{if } q = x, \end{cases} \tag{119}$$

and the speculator buys x shares if he learns that firm fundamentals are high ($A = 1$), short sells x shares if he learns that firm fundamentals are low ($A = 0$), and abstains otherwise.

Proof of Lemma C.1. The logic of this proof closely follows that of Lemma 1. Suppose the speculator buys x shares if he learns that firm fundamentals are high ($A = 1$), short sells x shares if he learns that firm fundamentals are low ($A = 0$), and abstains otherwise. In this case, the market expects the following distribution of order flow.

State	Speculator (q_S)	Probability	Order Flow		
$A=0$	$-x$	$(1-\theta)\phi$	-2x	-x	
$A=0$	0	$(1-\theta)(1-\phi)$		-x	0
$A=1$	0	$\theta(1-\phi)$		-x	0
$A=1$	x	$\theta\phi$			0 x.

Together, Bayesian updating and the market-clearing condition imply that

$$P_0^S(q) = \hat{\theta}_0^S(q) = \begin{cases} 0 & \text{if } q = -2x, \\ \frac{\theta(1-\phi)}{\theta(1-\phi)+(1-\theta)} & \text{if } q = -x, \\ \frac{\theta}{\theta+(1-\theta)(1-\phi)} & \text{if } q = 0, \\ 1 & \text{if } q = x, \end{cases} \tag{120}$$

[27] The speculator holds no shares at $t = 0$. If he did, his information would allow him to capture buyback gains in good states while avoiding losses in bad states by selling—making him better off than even liquidity-insulated shareholders. Assuming zero initial holdings keeps the focus on his role as an outside trader competing against the manager's informed buybacks.

Given this pricing rule, the expected market-clearing price if the speculator buys is strictly between θ and 1 (P_{Buy}) and the expected market-clearing price if the speculator sells is strictly between 0 and θ (P_{Sell}). Hence, buying is optimal if he learns that $A=1$ ($1>P_{Buy}$), short selling is optimal if he learns that $A=0$ ($P_{Sell}>0$), and abstaining is optimal if he learns nothing ($P_{Sell}<\theta<P_{Buy}$). ■

The results of Lemma C.1 follow the standard logic of Kyle-type informed trading frameworks. In any equilibrium where the pricing rule increases with the aggregate order flow, the speculator has no incentive to buy shares when he learns nothing. When he learns that $A=1$, the expected market-clearing price is strictly less than 1 due to noise trading, making buying optimal. When he learns that $A=0$, the expected market-clearing price is strictly positive due to noise trading, making selling optimal. The market makers' equilibrium pricing rule reflects this trading strategy: it increases with the observed order flow.

In this benchmark with short selling, the speculator's expected trading profit is

(121)
$$\Pi_0^S=\phi\theta\frac{x}{2}\left(1-P_0^S(0)\right)+\phi(1-\theta)\frac{x}{2}P_0^S(-x)=\phi(1-\phi)x\theta(1-\theta)\frac{1}{2}\left[\frac{1}{\theta+(1-\theta)(1-\phi)}+\frac{1}{\theta(1-\phi)+(1-\theta)}\right].$$

The following lemma describes the trading equilibrium with buybacks when the speculator can sell short.

Lemma C.2. *Given a stock buyback program and the manager's buyback execution strategy ($b_1=1,b_0$), the equilibrium pricing rule is*

$$P_B^S(q)=\mathbb{E}[V|q]=\begin{cases}0 & \text{if } q=-2x,-x,\\ \frac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)((1-\phi)+(k+\phi)b_0)} & \text{if } q=0,\\ \frac{\theta}{\theta+(1-\theta)(1-\phi)b_0} & \text{if } q=x,\\ 1 & \text{if } q=2x,\end{cases}\tag{122}$$

where $k=\frac{x}{1-x}$ reflects the scale of the buyback program, and the speculator buys x shares when he learns that $A=1$, short sells x shares when he learns that $A=0$, and abstains otherwise (i.e., he learns nothing).

Proof of Lemma C.2. The logic of this proof closely follows that of Lemma 1. Suppose the speculator buys x shares if he learns that firm fundamentals are high ($A=1$), short sells x shares if he learns that firm fundamentals are low ($A=0$), and abstains otherwise. Moreover, the manager executes buybacks with probability $b_1=1$ when $A=1$ and with probability $b_0\in[0,1]$ when $A=0$. In this case, the market expects the following distribution of order flow.

State	Firm (q_B)	Speculator (q_S)	Probability	Order Flow			
$A=0$	0	-x	$(1-\theta)\phi(1-b_0)$	-2x	-x		
$A=0$	x	-x	$(1-\theta)\phi b_0$		-x	0	
$A=0$	0	0	$(1-\theta)(1-\phi)(1-b_0)$		-x	0	
$A=0$	x	0	$(1-\theta)(1-\phi)b_0$			0	x
$A=1$	x	0	$\theta(1-\phi)$			0	x
$A=1$	x	x	$\theta\phi$				x 2x.

Let $k=\frac{x}{1-x}$. We have the following expressions for the prices that correspond to fully revealing order flows: $P_B^S(-2x)=0$, $P_B^S(-x)=0$, and $P_B(2x)=1$. For $q=0$ and $q=x$, we have

$$P_B^S(0)=\frac{(1-\theta)b_0}{\theta(1-\phi)+(1-\theta)((1-\phi)+\phi b_0)}(-kP_B^S(0))+\frac{\theta(1-\phi)}{\theta(1-\phi)+(1-\theta)((1-\phi)+\phi b_0)}(1+k(1-P_B^S(0))), \tag{123}$$

implying that

$$P_B^S(0)=\frac{\theta(1-\phi)(1+k)}{\theta(1-\phi)(1+k)+(1-\theta)((1-\phi)+(k+\phi)b_0)}, \tag{124}$$

and

$$P_B^S(x)=\frac{(1-\theta)(1-\phi)b_0}{\theta+(1-\theta)(1-\phi)b_0}(-kP_B^S(x))+\frac{\theta}{\theta+(1-\theta)(1-\phi)b_0}[1+k(1-P_B^S(x))], \tag{125}$$

implying that

$$P_B^S(x)=\frac{\theta}{\theta+(1-\theta)(1-\phi)b_0}. \tag{126}$$

Given this pricing rule, the speculator strictly prefers to buy upon learning that $A=1$, strictly prefers to short sell upon learning that $A=0$, and strictly prefers to abstain upon learning nothing. ■

In this case, the speculator's expected trading profit is

$$\begin{aligned}\Pi_B^S &= x\phi\theta\tfrac{1}{2}(1+k)\left[1-P_B^S(x)\right]+x\phi(1-\theta)b_0\tfrac{1}{2}(1+k)P_B^S(0),\\ &= x\phi(1-\phi)\theta(1-\theta)\tfrac{1}{2}(1+k)\left[\frac{b_0}{\theta+(1-\theta)(1-\phi)b_0}+\frac{(1+k)b_0}{\theta(1-\phi)(1+k)+(1-\theta)((1-\phi)+(k+\phi)b_0)}\right].\end{aligned} \tag{127}$$

Note that the speculator's expected trading profit strictly increases with b_0:

$$\frac{\partial\Pi_B^S}{\partial b_0}=x\phi(1-\phi)\theta(1-\theta)\tfrac{1}{2}(1+k)\left[\frac{\theta}{[\theta+(1-\theta)(1-\phi)b_0]^2}+\frac{(1+k)[\theta(1-\phi)(1+k)+(1-\theta)(1-\phi)]}{[\theta(1-\phi)(1+k)+(1-\theta)((1-\phi)+(k+\phi)b_0)]^2}\right]>0. \tag{128}$$

Moreover, note that

$$\Pi_B^S\big|_{b_0=0}=0<\Pi_0^S \tag{129}$$

and

$$\Pi_B^S\big|_{b_0=1}=x\phi(1-\phi)\theta(1-\theta)\tfrac{1}{2}(1+k)\left[\frac{1}{\theta+(1-\theta)(1-\phi)}+\frac{1}{\theta(1-\phi)+(1-\theta)}\right]>\Pi_0^S. \tag{130}$$

Hence, there exists a $\bar{b}_0^S\in(0,1)$ such that $\Pi_B^S<\Pi_0^S\Leftrightarrow b_0<\bar{b}_0^S$.