Investor Heterogeneity, Investor-Management Disagreement and Share Repurchases

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This paper develops and tests a new theoretical explanation for stock repurchases. Investors may disagree with the manager about the firm's investment projects. A repurchase causes a change in the investor base as investors who are most likely to disagree with the manager tender their shares. Therefore, a firm is more likely to buy back shares when the level of investor-management agreement is lower, and agreement improves as a consequence. Moreover, dispersion of opinion among investors cannot explain repurchase activity once the stock price and investor-management agreement are controlled for. Overall, the evidence is consistent with firms strategically using repurchases to improve alignment between management and shareholders. (*JEL* G30, G35)

The past two decades have seen dramatic changes in corporate payout policy. In particular, stock repurchases have increased in popularity, while the proportion of dividend-paying firms has declined (Fama and French 2001; Grullon and Michaely 2002; Skinner 2008).[1] Although in a Modigliani and Miller (1958) world, a firm's payout mix does not matter for firm value, an interesting question is what sort of frictions would cause a firm to prefer cash disbursement through a share repurchase instead of a dividend? The purpose of this paper is to develop

[1] The 2003 dividend tax cut caused an increase in dividends, but there was also a simultaneous spike in repurchases after the tax cut (Chetty and Saez 2005, 2006). Chetty and Saez (2006) suggest that repurchases may have increased even more, absent the tax change. Dividend payments may also be affected by CEO overconfidence; see Deshmukh, Goel, and Howe (2013).

a new theoretical explanation for why firms conduct open-market and privately negotiated repurchases and to empirically test the predictions of the theory.

The existing literature offers various explanations for why firms repurchase stock (see Allen and Michaely 2003; DeAngelo, DeAngelo, and Skinner 2008 for a summary). A popular explanation is the information asymmetry/signaling hypothesis. For example, Ofer and Thakor (1987) provide a theory in which firms can signal with both dividends and tender-offer repurchases and explain the relative magnitudes of price reactions to these signals. Strong empirical support has been provided for the signaling role of repurchases in the context of self-tender offer repurchases.[2]

Although a compelling motivation for tender-offer repurchases, the signaling story has a few holes in the context of open-market and privately negotiated repurchases.[3] First, with open-market repurchases, the market only knows the aggregate amount of repurchases approved by the Board of Directors, not the exact timing of the repurchase or how much is being repurchased at any point in time.[4] Theoretically, therefore, it is hard to see how the repurchase could act as a signal when investors are not aware of the repurchase when it occurs.[5] The signaling argument for open-market repurchases encounters difficulties from an empirical standpoint as well. For example, Grullon and Michaely (2004) find no evidence of postrepurchase operational improvement in firms that announce share repurchase programs, which runs counter to the presumed favorable private information possessed by managers prior to the repurchases.[6] Moreover,

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[2] For examples, see Asquith and Mullins (1986), Comment and Jarrell (1991), Dann (1981), D'Mello and Shroff (2000), Lie and McConnell (1998), Louis and White (2007), and Vermaelen (1981).

[3] Comment and Jarrell (1991) state that "the bulk of buyback activity is conducted through open-market repurchase programs and dutch-auction self-tender offers, methods which have less signaling effectiveness than the conventional fixed-price offer. This suggests that most stock buyback activity may be principally motivated by objectives other than (or in addition to) signaling stock undervaluation." Accelerated share repurchase programs, adopted in the last few years, may help get around some of these issues. See Bargeron, Kulchania, and Thomas (2011) and Chemmanur, Cheng, and Zhang (2010) for a discussion.

[4] The literature similarly argues that a problem with considering open-market repurchase programs as costly signals is that the programs are not firm commitments, and thus the completion rate of these programs varies substantially across companies. See, for example, Stephens and Weisbach (1998) and Rau and Vermaelen (2002).

[5] Oded (2005) presents an asymmetric information-based signaling model to explain the positive announcement returns of open-market repurchase programs. Yet the literature also documents several sources of announcement returns that are unrelated to signaling. See Babenko (2009), Dittmar (2000), Grullon and Michaely (2004), and Maxwell and Stephens (2003), among others. Further, Babenko, Tserlukevich, and Vedrashko (2012) suggest that although managers may buy stock prior to a repurchase program announcement, such purchases are likely to be motivated by personal wealth maximization rather than an intention to convey information. For an asymmetric information justification for open-market repurchases that does not involve signaling, see Brennan and Thakor (1990), who show that large shareholders will have an incentive to acquire costly information about the firm to enable them to decide whether to tender their shares when the firm repurchases shares, whereas small shareholders will prefer to avoid the information acquisition cost and remain uninformed. Thus, a repurchase creates a relative advantage for large shareholders that dividends do not, and firms will repurchase shares when the preferences of large shareholders dominate the firm's decision. Also, Constantinides and Grundy (1989) develop a model in which firms simultaneously issue securities and repurchase stock and derive a separating equilibrium in which insiders and outside investors end up with the same valuation of the firm.

[6] Lie (2005) shows that firms with actual repurchases after open-market repurchase program announcements experience improvements in operating performance relative to their control firms. However,

the survey evidence in Brav et al. (2005) suggests that managers do not use open-market repurchases as a signaling tool per se. With privately negotiated repurchases, the fact that shares are often repurchased without any premium is also inconsistent with the signaling hypothesis. Peyer and Vermaelen (2005) suggest that such repurchases are mere wealth transfers between the firm and the selling shareholders.

A second hole in the signaling story is that it suggests that firms will repurchase stock during periods of low market valuation because that is when undervaluation is most likely. Yet the bull market of 2003–2007 witnessed large amounts of open-market repurchases, and Dittmar and Dittmar (2008) explicitly show that aggregate repurchases go up with stock market valuation. Moreover, it appears that the firms that are paying dividends are not those that one would typically associate with signaling. DeAngelo, DeAngelo, and Skinner (2004) document that dividends are increasingly concentrated among a small number of large firms with predictably high earnings, namely, firms that are likely to be characterized by low levels of information asymmetry and need for signaling.

As an alternative to signaling, we build on the prior literature of investor-management disagreement (e.g., Boot, Gopalan, and Thakor 2006, 2008; Dittmar and Thakor 2007; Song and Thakor 2010) and offer a new explanation for open-market and privately negotiated repurchases. Our explanation is based on the idea that management can use a repurchase to effect a change in the firm's investor base. Specifically, we argue that different groups of investors may have heterogeneous prior beliefs about the profitability of the firm's future investment opportunities, and this may cause some to agree with management's decisions and others to disagree. For example, some investors may endorse the manager's view that the firm should diversify into a new line of business through acquisitions, whereas others may view diversification as a bad idea. Management would like to invest in all projects it believes to have positive NPV. However, because the degree to which investors endorse its decisions will affect the firm's stock price, something management is concerned with, managers seek to increase the likelihood of investor endorsement of managerial decisions and hence investor-management alignment. An open-market or privately negotiated repurchase facilitates such alignment by providing a mechanism to buy out investors who are more likely to disagree with management and concentrating ownership in the hands of investors more likely to agree with management.

Notice that even when a firm buys back shares at the market price without any premium, a repurchase can serve the purpose of buying out the lowest-agreement investors. This is because at any stock price the marginal shareholders who are indifferent between selling and holding their stock are willing to randomize between selling and holding, and thus some will sell if there is a buy order at the market price. An open-market or privately

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Gong, Louis, and Sun (2008) suggest that the reported improvement in operating performance is likely to be driven by prepurchase downward earnings management rather than genuine growth in profitability.

negotiated repurchase program creates the buy orders.[7] Furthermore, due to wealth constraints and/or risk aversion, inframarginal investors who agree more with management and thus value the firm above its stock price might not absorb all the shares that the marginal investors are willing to sell as part of their randomized sell-hold strategy. So the firm's buyback helps to clear the market.

We develop a simple theoretical model based on this intuition. The model leads to three predictions. First, the likelihood of a firm undertaking a repurchase is higher when the level of investor-management agreement is lower. Second, investor-management agreement improves following the repurchase. Third, dispersion of opinion *among* investors is not a driver of repurchases, once the stock price and investor-management agreement are controlled for. Using different measures of investor-management agreement, we find strong empirical support for these predictions.

Because lower agreement will typically lead to a lower stock price (see Dittmar and Thakor 2007), the implication of our agreement hypothesis may be confounded by the conventional market-timing hypothesis, which argues that firms buy back shares when they are undervalued. Our model explicitly incorporates this undervaluation component and shows that a firm's stock price depends on both the agreement parameter and a random source of valuation that is unrelated to agreement. The expected benefit from repurchasing is determined by both the change in agreement and the prior firm valuation. That is, there are two effects at work: a capital gain from repurchasing stock at a low price (market timing) and an increase in agreement from removing relatively low-valuation investors via repurchases (disagreement reduction). The results of our empirical analysis confirm that the effect of disagreement on repurchases persists even after controlling for the stock price (the market timing influence).

In addition, while open-market or privately negotiated repurchases are not likely to be motivated by signaling, one may argue that they could be nonetheless driven by some non-signaling-related information asymmetry. For example, investors may suspect managers of engaging in the extraction of private benefits and may overestimate or underestimate the negative valuation impact of this, getting it right only on average but believing that they are always right about the valuation impact. Managers, possessing superior information, always assess the valuation impact correctly. When investors overestimate the negative valuation impact, the stock is undervalued, so management responds by repurchasing stock. In contrast, if investors underestimate the negative valuation impact, the manager may either do nothing or sell his own stockholding.

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[7] Cook, Krigman, and Leach (2004) document that open-market repurchases by firms in the U.S. increase the market liquidity of repurchasing firms' stock. Brockman and Chung (2001) present evidence from Hong Kong that open-market repurchases reduce liquidity on the day of actual repurchases.

Note that the information asymmetry hypothesis posits that this effect arises from investors having access to different information sets. By contrast, our hypothesis is that disagreement arises because investors assess information in different ways. In particular, we argue that differences in investors' interpretations arise from heterogeneous prior beliefs, which cannot be reconciled even in the absence of information asymmetry. Some investors' beliefs are aligned with management's, but others are not. Further, the arrival of information through time in a given firm helps to mitigate the information asymmetry between management and investors. Agreement, however, does not necessarily improve with the mitigation of information asymmetry.

We empirically distinguish our agreement hypothesis from this information-asymmetry argument in various ways. First, we rely on firm fixed effects estimation, wherever appropriate, to utilize within-firm variation in examining a firm's decision to repurchase. This diminishes the likelihood of picking up information asymmetry effects that would be expected to be more pronounced in a cross-sectional analysis. Moreover, we run an empirical horse race by including in the regressions two measures of information asymmetry that are unrelated to investor-management disagreement: the idiosyncratic volatility of stock returns and the standard deviation of earnings announcement abnormal returns over a prior period. Second, we test the different implications of these two hypotheses. (1) Our disagreement hypothesis predicts that, for any fixed repurchase size, the improvement in agreement should be greater if the demand curve of the firm's shares is more inelastic.[8] However, under the information asymmetry hypothesis, all investors are equally concerned about managerial rent seeking, and thus the demand curve is flat. As a result, there is no predicted impact on agreement due to the repurchase. (2) Our model implies a greater investor propensity to endorse management decisions, which arises from the increase in agreement induced by the repurchase. The market can thus be expected to respond positively to the repurchase announcement in anticipation of the improvement in agreement, and this response should be greater the lower the initial agreement. Also, repurchasing firms should experience positive abnormal returns in the long run subsequent to the repurchases being conducted and the improvement in agreement being realized. Under the information asymmetry hypothesis, repurchases do not change investor valuation of management decisions and the firms unless they are a credible signal (but as discussed earlier, they are not). The results strongly support our disagreement hypothesis.

Our paper is related to the shareholder heterogeneity argument of Bagwell (1991b, 1992) that firms face upward-sloping supply curves for their shares due to cross-sectional heterogeneity among investors in their valuation of the firm. Bagwell (1991a) argues theoretically that a stock repurchase can be used

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[8] Cross-sectional heterogeneity among investors in their extent of agreement with the managers leads to an imperfectly elastic demand curve for shares.

as a takeover deterrent. As shareholders with the lowest valuations tender their shares, the repurchase skews the distribution of remaining shareholders and makes the takeover more expensive. Stulz (1988) similarly shows that management can repurchase shares to increase the fraction of votes it controls, with the increase in control contributing to firm value by increasing the premium offered in the event of a hostile takeover attempt. In our paper, shareholders are heterogeneous in the sense that they have different propensities to agree with management. While this notion of dispersion of opinion among investors is critical to our theory, a key distinguishing feature of our research is that we show that it is investor-management disagreement, and not disagreement among investors (which may also generate heterogeneity in investors' valuation of the firm), that provides an impetus for repurchases. Using the empirically supported idea that dispersion of investor opinion, combined with short-sale constraints, may lead to firm overvaluation (Miller 1977; Chen, Hong, and Stein 2002; Diether, Malloy, and Scherbina 2002; Diether 2004), we distinguish between the two related notions. We show that, holding investor-management disagreement fixed, dispersion of investor opinion is negatively related to a firm's repurchase decision due to the overvaluation effect. Thus, ours is the first paper to document investor-management disagreement as a statistically and economically important driver of repurchases.

A second strand of literature related to our paper examines a firm's preference for repurchases in its payout mix. Studies such as Guay and Harford (2000) and Jagannathan, Stephens, and Weisbach (2000) argue that firms prefer to use repurchases rather than dividends to adjust payouts in response to transitory cash flow shocks, as repurchases are relatively flexible compared to the more rigid payout commitments of dividends.[9] Other papers relate the surge in repurchases to the increased use of stock options to compensate management and employees (e.g., Babenko 2009; Fenn and Liang 2001; Kahle 2002; Weisbenner 2004). We control for these well-documented factors and find that the effect of disagreement on a firm's repurchase decision persists. Like us, Gaspar et al. (2013) also link shareholder characteristics to the share repurchase decision. They suggest that firms repurchase to cater to the payout policy preference of short-term oriented institutional investors. That paper's empirical approach—the estimation of the investment horizon as the inverse of the turnover of institutional investors—is in the spirit of our use of mutual fund holdings as a proxy for the breadth of ownership of a stock. However, the focus of that paper is on how the characteristics of investors impinge on the repurchase decision, and they do not examine the impact of disagreement between investors and management. This disagreement, which is our focus, reflects, at least in part, the characteristics of management.

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[9] Oded (2013) formally models the value of flexibility in open-market repurchases and its trade-off with the agency cost of free cash flow.

A third strand of the literature to which our paper contributes is that on the corporate finance and contracting implications of disagreement based on differences in beliefs. See, for example, Allen and Gale (1999), Boot, Gopalan, and Thakor (2006, 2008), Boot and Thakor (2011), Coval and Thakor (2005), Dittmar and Thakor (2007), Garmaise (2001), Kandel and Pearson (1995), Song and Thakor (2007, 2010), Thakor (2012), Thakor and Whited (2011), and Van den Steen (2004, 2010a, 2010b).

The rest of this paper is organized as follows. Section 1 develops our paper's theory and testable hypotheses. Section 2 describes the sample and variables used in the empirical tests. Section 3 presents our main analysis on management-investor disagreement. Section 4 distinguishes our disagreement hypothesis from the information asymmetry hypothesis. In Section 5 we conduct additional robustness checks. Section 6 concludes. Definitions of variables appear in the Appendix.

1. Theory and Empirical Predictions

Imagine a firm whose manager makes decisions that affect the firm's value. The firm is publicly traded in a market in which no short sales are allowed. The manager always seeks to make decisions that maximize firm value, but investors may disagree that a particular decision is value maximizing. If investors agree with the manager's decision, they value the firm at $V_G + \varepsilon$, and if they disagree, they value the firm at $V_B + \varepsilon < V_G + \varepsilon$, where ε is a random source of noise in the investor's valuation of the firm that is uncorrelated with the decision-linked source of value (V_G or V_B). It is assumed that, for a randomly chosen investor, $\varepsilon = \varepsilon_1 > 0$ with probability 0.5 and $\varepsilon = -\varepsilon_1$ with probability 0.5. The probability that investor group i will agree with the manager is ρ_i. Thus, investor j in group i assigns a value V_i^j to the firm, where

$$V_i^j = \rho_i V_G + (1 - \rho_i) V_B + \varepsilon_i^j,$$

with $\varepsilon_i^j \in \{-\varepsilon_1, \varepsilon_1\}$. Whereas all investors in group i have the same ρ_i, each investor within any group randomly draws one of the two values of ε, with the specified probabilities.

Due to wealth endowment constraints, risk aversion, or both, each investor group holds a limited fraction of the firm's shares. In equilibrium the firm will therefore be held by investors with different agreement parameters, ρ_i. The lowest agreement parameter will be that of the marginal group of investors, with inframarginal investors having higher values of ρ_i. It is clear that V_i^j is strictly increasing in ρ_i for any j.

For simplicity, assume that the amount of wealth invested in the firm by any investor group is the same across all investor groups that are long in the

stock[10] and that the distribution of the mass of investors is uniform across $\rho \in \{\rho_0, \rho_1, \ldots, \rho_{max}\}$, where ρ_0 is the ρ of the marginal investor in the stock and ρ_{max} is the ρ of the investor with the highest ρ in the stock. Also assume, for simplicity, that the ρ's in $\rho_0, \rho_1, \ldots, \rho_{max}$ are evenly spaced apart, so that $\rho_1 - \rho_0 = \rho_2 - \rho_1 = \rho_3 - \rho_2 = \ldots$ and that $\rho_{i+1} - \rho_i > 2\varepsilon, \forall_i$. Dropping the superscript j, the firm's stock price will then be

$$V_0 = \rho_0 V_G + (1 - \rho_0) V_B + \varepsilon, \tag{1}$$

where ε is the idiosyncratic portion of valuation for the marginal investor within the ρ_0 group.

At this point, it is useful to pause and interpret the two key parameters of the model: ρ and ε. The agreement parameter ρ represents the degree of alignment or agreement between management and investors. That is, as in Boot and Thakor (2011) and Dittmar and Thakor (2007), it represents the probability with which investors will endorse a decision that management believes is value enhancing. The firm's stock price is increasing in the value of this parameter for the marginal investor. The parameter ε represents dispersion of opinion about firm value among investors who all have the same degree of alignment with management.

If the firm repurchases stock at the prevailing market price V_0 or a slightly higher price, the first shareholders to sell will be the marginal investors with $\rho = \rho_0$. Note that the marginal investors are indifferent between selling the stock and not selling it, so they will randomize across selling and holding. We assume that some fraction $f \in (0, 1]$ of the marginal investors will sell. As the firm repurchases larger amounts, it will have to pay higher prices to induce investors with higher value of ρ to sell, given our assumption that there is a limited number of investors of any ρ who are long in the stock and can thus sell. Suppose the firm has to invest $\$C$ in repurchasing stock to increase the ρ of the marginal investors from ρ_0 to ρ_1, with an improvement of $\Delta\rho$ defined as

$$\Delta\rho(C, \rho_0) = \rho_1 - \rho_0. \tag{2}$$

Let $B(\Delta\rho)$ be the benefit to the firm of increasing the ρ of the marginal investors by $\Delta\rho$ and $E(B(\Delta\rho))$ be the expected value of this benefit. We can write $E(B)$ as

$$E(B(\Delta\rho)) = E(V_1(\rho_0 + \Delta\rho)) - V_0 - \tau, \tag{3}$$

where V_0 is defined in (1) above, $\tau > 0$ is a fixed transaction cost of repurchasing stock, and

$$V_1(\rho_0 + \Delta\rho) = \rho_1 V_G + (1 - \rho_1) V_B + \varepsilon, \tag{4}$$

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[10] This assumption is reasonable if investors are risk neutral and wealth constrained with equal wealth endowments. More generally, we would expect investors with higher ρ_i's to invest more. However, the results are even stronger under the latter specification.

so $E(V_1(\rho_0 + \Delta\rho)) = \rho_1 V_G + (1 - \rho_1)V_B$, which means we can write (3) as

$$E(B(\Delta\rho)) = [\rho_1 - \rho_0][V_G - V_B] - \varepsilon - \tau. \tag{5}$$

Note from (5) that $E(B(\Delta\rho))$ depends on the change in agreement $\rho_1 - \rho_0$ and the actual value of ε associated with V_0. That is, there are two effects at work: (1) a wealth transfer benefit from repurchasing stock at too low a price when $\varepsilon = -\varepsilon_1$ (the market-timing hypothesis), and (2) an increase in investor-management agreement via the repurchase due to the exit of low-valuation investors.

We assume that there are diminishing returns to scale in the investment C made in improving ρ. That is, if $C(j, j+1)$ is the amount that must be spent on a repurchase to increase the marginal investor's ρ from ρ_j to ρ_{j+1}, then given the equal-spacing assumption about the ρ's, diminishing marginal returns imply $C(j, j+1) < C(k, k+1)\forall_j < k$.

Viewing C as an investment in the repurchase, the firm chooses C to maximize its net benefit from the repurchase:

$$\pi = E(B(\Delta\rho)) - C. \tag{6}$$

Now consider a firm whose marginal investor has agreement ρ_0, and let C_0 be the optimal value of C for this firm. Let the resulting agreement parameter of the marginal investor after the repurchase be ρ_{c_0}. Thus,

$$\pi_0 = [\rho_{c_0} - \rho_0][V_G - V_B] - C_0 - \varepsilon - \tau. \tag{7}$$

Next consider another firm whose marginal investor has agreement $\rho_0' > \rho_0$, and suppose this firm also spends C_0 on repurchasing stock. Then for this firm

$$\pi_0' = [\rho_{c_0}' - \rho_0'][V_G - V_B] - C_0 - \varepsilon - \tau. \tag{8}$$

where ρ_{c_0}' is the agreement parameter of the marginal investor in this firm after the repurchase. It is clear that

$$\rho_{c_0}' \leq \rho_{c_0} \tag{9}$$

because $\rho_0' > \rho_0$ and there are diminishing marginal returns in repurchasing stock to improve agreement. This implies that $\rho_{c_0} - \rho_0 > \rho_{c_0}' - \rho_0'$.

Thus, the first prediction of the model is that, controlling for the amount of money spent in the repurchase, the higher is the level of prepurchase agreement, the smaller is the postrepurchase improvement in agreement. To examine the implication of this for the likelihood of a repurchase, suppose $\rho_{c_0} = \rho_1$, that is, it is optimal for the firm with the agreement of the marginal investor of ρ_0 to increase its agreement parameter by only one notch. Then the firm with the prepurchase agreement parameter of ρ_0' would be unable to increase its agreement parameter by even one notch if it spends the same amount C_0 on a repurchase. Thus, a firm is more likely to undertake a repurchase when agreement is lower. Because a firm's stock price depends on both the agreement

parameter ρ and the idiosyncratic portion of valuation ε, the effect of agreement on the repurchasing decision will persist even after controlling for the stock price.

The second prediction that is evident is that the level of agreement improves following a repurchase. This follows directly from the structure of the model and the above analysis.

We have assumed that no short sales are allowed. With such restrictions, the supply of shares at any time is smaller than it would be without such restrictions, so the agreement parameter of the marginal investor, ρ_0, is higher with these restrictions. If the short-sale constraint is lifted, there will be an additional supply of shares for sale in the market at any price, implying that the marginal ρ_0 will be lower, leading to a lower (equilibrium) price at which the market will clear. That is, the presence of short-sale constraints decreases the likelihood of a repurchase.

It is also useful to return to the roles of the agreement parameter ρ and the idiosyncratic valuation parameter ε. Suppose there was no disagreement (i.e., $\rho = 1$ for all investors), then (1) becomes

$$V_0 = V_G + \varepsilon. \tag{10}$$

All that is left now is dispersion of opinion *among* investors, as captured by ε, and (7) becomes

$$\pi = -C_0 - \varepsilon - \tau. \tag{11}$$

If $\varepsilon = -\varepsilon_1$, it may still pay for the firm to do a limited repurchase to buy out the marginal investors with $\varepsilon = -\varepsilon_1$ and achieve the corresponding gain in stock price as long as $\varepsilon_1 > \tau$. This is the familiar market timing argument that was previously discussed. But it is apparent from a comparison of (7) and (11) that the extent of repurchasing will be lower when there is no investor-management disagreement. Moreover, if $\varepsilon_1 \leq \tau$, a repurchase will not occur. Thus, the third prediction of the model is that when there is only dispersion of opinion among investors but no difference of opinion between the manager and investors, repurchasing activity will be dampened and may vanish altogether.

The above analysis leads to the following testable hypotheses:

Hypothesis 1: A firm is more likely to undertake a repurchase when its investor-management agreement is lower.

Hypothesis 2: Investor-management agreement improves following a repurchase.

Hypothesis 3: Dispersion of opinion among investors, controlling for the stock price and the level of manager-investor agreement, cannot explain significant repurchase activity. That is, once the stock price and manager-investor agreement are controlled for, higher dispersion of opinion among investors does not lead to significantly higher repurchase activity.

2. Data and Variables

2.1 Data, sample, and variable construction

We construct our initial sample by starting with all U.S. firms in COMPUSTAT from 1987 to 2010 that list their common stock in NYSE, NASDAQ, or AMEX. We omit all utility and financial firms whose primary SIC classification is between 4900 and 4999 and between 6000 and 6999, respectively. We require that a firm's main annual accounting, stock return, and agreement proxy data be available during a sample year for it to be included in the sample. We obtain firm-level accounting data from COMPUSTAT, return data from CRSP, repurchase announcement data from SDC, mutual fund holding data from CDA/Spectrum, analysts' earnings forecast data from I/B/E/S, monthly short interest data from COMPUSTAT and NASDAQ, and managerial ownership and unexercised options data from ExecuComp. Data of shareholder proxy proposals (1996–2010), and shareholder voting as well as ISS recommendations in director elections (2003–2010) are from Institutional Shareholder Services (ISS).[11] In cases in which the company CUSIP is missing in the shareholder proxy proposal dataset, we manually search for it in COMPUSTAT and CRSP using the reported company name. We follow Del Guercio, Seery, and Woidtke (2008) and search through LexisNexis and Factiva to collect data on shareholders' "just vote no" campaign, whereby activists encourage their fellow shareholders to withhold votes toward a director's election from 2004 to 2010.[12] As we discuss below, our final sample size varies with different agreement proxies due to different degrees of data availability.

As our main variables, we use four proxies for investor-management agreement: (1) whether a firm receives proxy proposals in a year, (2) vote recommendation in directors' elections, (3) actual voting that director candidates receive in director elections, and (4) dual-class control premium. We also use a set of control variables, which include firm size, operating income, nonoperating income, market-to-book, capital expenditure, debt ratio, and stock returns. All have been used in the prior stock repurchase literature (e.g., Dittmar 2000; Jagannathan, Stephens, and Weisbach 2000; Guay and Harford 2000). Details on definitions of all variables can be seen in the Appendix. To reduce the impact of outliers, we follow the literature and winsorize all continuous variables at the 1st and 99th percentiles.

2.2 Summary statistics

Panel A of Table 1 presents summary statistics on the four measures of investor-management agreement. For the 16,295 firm-years (1,198 firms) with available proxy proposal data during 1987–2010, an average firm receives proxy proposal(s) once every five years. On average, 9% of the director

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[11] We thank Stuart Gillan for sharing the shareholder proxy proposal data from 1987 to 1995.

[12] We thank Diane Del Guercio for the helpful discussion on "just vote no" campaigns and the data on this for 2003.

Table 1
Summary statistics

	Mean	Median	SD	N
Panel A: Measures of investor-management agreement				
Proxy proposal	0.21	0	0.41	16,295
Voting recommendation	0.09	0	0.21	14,828
Actual voting	0.66	1	0.47	9,748
Dual-class control premium	0.03	0.01	0.15	995
Panel B: Repurchase and Firm characteristics				
Frequency	0.364	0.333	0.268	1,198
Repurchase expense	0.043	0.024	0.05	6,320
Sales ($MM)	5,596.82	1,313.14	16,492.04	16,295
Operating income	0.14	0.14	0.09	16,295
Nonoperating income	0.01	0.01	0.01	16,295
Capital expenditure	0.06	0.05	0.05	16,295
Market-to-book	3.09	2.17	3.03	16,295
Debt ratio	0.19	0.17	0.15	16,295
Stock returns	0.16	0.09	0.47	16,295

Panel A reports summary statistics for the four measures of investor-management agreement: *Proxy proposal*, a dummy that equals one if a firm receives one or more proxy proposals in a given year and is zero otherwise; *Voting recommendation*, the proportion of director candidates receiving a vote-no recommendation from ISS or certain shareholders in a vote-no campaign, among all candidates in the firm who are up for the election in a given year; *Actual voting*, a dummy that equals one if there are one or more director candidates who are up for election and receiving fewer votes than the sample median in a given year and is zero otherwise; and *Dual-class control premium*, the mean difference in monthly stock price between voting and nonvoting shares in a firm-year divided by the price of nonvoting shares. Panel B provides summary statistics of share repurchases and firm characteristics for an unbalanced panel of 1,198 firms from 1987 to 2010 (16,295 firm-years) that have received at least one or more shareholder proxy proposals during the sample period. *Frequency* is the proportion of years that a firm has positive net repurchase in the sample period. *Repurchase expense* is the dollar amount of net repurchase if it is positive, divided by the book value of total assets as of the prior year end. Other firm-level accounting variables and stock returns, presented as of the year prior to repurchase, are self-explanatory.

candidates in a firm-year have been recommended "withhold" or "against" votes by ISS or/and shareholder activists in the sample of 14,828 firm-years (2,546 firms) from 2003 to 2010. In the average 66% cases for the sample of 9,748 firm-years (2,351 firms) during 2003–2010, firms have at least one director candidate's votes received lower than the sample median of the year. For the 141 firms with traded dual-class stocks, the mean (median) control premium of the superior stocks is 0.03 (0.01).

As discussed above, the samples of different agreement measures do not overlap perfectly. Thus, we choose the most complete sample during 1987–2010—namely, the shareholder proxy proposal sample—in reporting the repurchase and firm characteristics. As shown in Panel B, an average firm makes net repurchases once every three years, and it spends an amount as much as 4.3% (median 2.4%) of the firm's prior-year-end book value of total assets on each repurchase. Other firm characteristics for the sample firms are comparable to those in the literature.

3. Empirical Analysis: Investor-Management Disagreement

This section discusses empirical tests of our three hypotheses and, conditional on the decision to repurchase, a firm's choice of mode: open-market or privately negotiated repurchases.

3.1 Tests of Hypothesis 1

To test this hypothesis, we run logistic regressions of a firm's repurchase decision on the prepurchase agreement parameters as well as a set of control variables. More specifically, our examination is based on the following baseline model:

$$Repurchase_{i,t} = \alpha + \beta_1 {}^* Agreement_{i,t-1} + \beta_2 {}^* Controls_{i,t-1} + \eta_t + \varepsilon_{i,t} \quad (12)$$

The dependent variable $Repurchase_{i,t}$ is a dummy that equals one if firm i makes positive net repurchases in year t and is zero otherwise. We measure repurchase using a dummy variable to reflect the prediction of the model that firms with lower agreement parameters are more likely to undertake repurchases.[13] Nevertheless, we also use the expense of repurchase (denominated by book value of total assets as of the year beginning) as the dependent variable and the results generally hold. The independent variables include a proxy for the agreement parameter for firm i in year $t-1$, as well as a set of control variables for firm i in year $t-1$. The control variables are those listed earlier in Section 2.1. Our primary interest is in examining whether the estimated coefficients on our agreement parameters are statistically significant and economically meaningful. We include yearly and industry dummies in the regressions, and robust standard errors are clustered at the industry-year level. Note that the independent variables are lagged one period relative to the dependent variable because it is the agreement parameter in place at the end of the previous period that drives the repurchase decision this period.

As discussed in the Appendix, when proxy proposal is used as an agreement proxy, in our sampling we take firms that have experienced at least one proxy proposal submission during the sample years. Similarly, we include firms that are covered by ISS when using director election in constructing the other two main agreement proxies. Thus, there might be an omitted variable concern that any unobserved firm-specific factors might be driving both the repurchase decision and the level of agreement. It could potentially confound the interpretation of the findings in the cross-sectional logistic regressions. We address this concern by running a firm fixed effects estimation of a firm's repurchase decision, using a linear probability model. This approach eliminates the impact of any unobserved firm-specific factors in exploiting the within-firm variations of the variables over time. Of course, we are aware of the linearity limitation involved in this linear probability analysis. As such, we take the firm fixed effects estimation as an ancillary approach when the dependent variable is a discrete choice and only report the results in the benchmark analysis (Table 2).

Table 2 presents the baseline results of the firm fixed effects estimations (odd columns) and the logistic regressions (even columns, coefficients of

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[13] Skinner (2008) suggests that the overall level of repurchases is determined by earnings, while other factors help explain the timing of repurchases.

Table 2
The effect of agreement on the repurchase decision: Baseline regressions

	Agreement Proxies							
	Proxy proposal		Voting recommendation		Actual voting		Dual-class premium	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Agreement$_{t-1}$	0.035***	0.036***	0.049**	0.051***	0.038**	0.057***	0.410***	0.534***
	(0.003)	(0.001)	(0.016)	(0.007)	(0.020)	(0.001)	(0.009)	(0.000)
Stock return$_{t-1}$	−0.034***	−0.066***	0.002	−0.041***	0.015	−0.044***	−0.064**	−0.143***
	(0.000)	(0.000)	(0.807)	(0.000)	(0.134)	(0.001)	(0.049)	(0.003)
Operating income$_{t-1}$	0.700***	1.318***	0.295***	1.088***	0.302***	1.168***	0.508	0.896***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.286)	(0.004)
Nonoperating income$_{t-1}$	1.918***	2.905***	1.101***	2.933***	0.460	2.474***	−0.141	1.122
	(0.000)	(0.000)	(0.004)	(0.000)	(0.400)	(0.000)	(0.955)	(0.538)
Capital expenditure$_{t-1}$	−0.725***	−1.296***	−0.311**	−1.359***	−0.412**	−1.486***	−0.237	−0.887**
	(0.000)	(0.000)	(0.010)	(0.000)	(0.018)	(0.000)	(0.625)	(0.012)
Market-to-book$_{t-1}$	−0.004*	−0.007***	−0.000	0.002	0.005*	0.005**	−0.024*	−0.011
	(0.071)	(0.000)	(0.965)	(0.199)	(0.090)	(0.017)	(0.089)	(0.189)
Debt ratio$_{t-1}$	−0.527***	−0.426***	−0.573***	−0.367***	−0.683***	−0.381***	−0.345	−0.355***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.130)	(0.006)
Sales$_{t-1}$ (log)	0.088***	0.060***	0.067***	0.074***	0.122***	0.073***	0.073	0.061***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.221)	(0.000)
Firm fixed effects	yes	no	yes	no	yes	no	yes	no
Observations	16,295	16,272	14,828	14,810	9,748	9,728	953	930
R^2/Pseudo R^2	0.105	0.130	0.077	0.145	0.083	0.132	0.140	0.166

This table presents results from firm fixed effects regressions (columns of odd numbers) and logit regressions (columns of even numbers), where the dependent variable equals one if the firm makes repurchase in year t and is zero otherwise. The investor-management agreement proxy used in each regression is indicated at the top of the table. Four measures of agreement are used: *Proxy proposal*, a dummy that equals one if a firm receives one or more proxy proposals in a given year and is zero otherwise; *Voting recommendation*, the proportion of director candidates receiving a vote–no recommendation from ISS or certain shareholders in a vote–no campaign, among all candidates in the firm who are up for the election in a given year; *Actual voting*, a dummy that equals one if there are one or more director candidates who are up for election and receiving fewer votes than the sample median in a given year and is zero otherwise; and *Dual-class control premium*, the mean difference in monthly stock price between voting and nonvoting shares in a firm-year divided by the price of nonvoting shares. All other control variables are defined in the Appendix and are measured as of the year prior to repurchase. Coefficients of the marginal effect are reported in the logit regressions. All regressions include year and industry dummy variables. Robust standard errors are clustered by industry-year, and *p*-values are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

the marginal effect are reported). The estimated coefficients of the four (dis)agreement proxies are statistically significant and are consistent with the prediction of our agreement hypothesis. The results hold after controlling for prior stock returns and market-to-book ratio proxies for firms' market-timing incentive. This suggests that, ceteris paribus, firms are more likely to buy back shares when the investor-management agreement is lower. In accordance with the odds ratios obtained from the logistic regressions, the odds of a repurchase are 15.9% higher following a shareholder proxy proposal and 27.5% higher after one or more director candidates receive a below-the-median "for" votes in the director election than are the odds of a repurchase otherwise. Also, there is an increase of about 5.5% and 176.6% in the odds of a repurchase for a standard deviation increase in the proportion of director candidates receiving "vote no" recommendations and in the dual-class control premium, respectively.[14] These magnitudes are economically significant. The magnitudes of the coefficients obtained from the firm fixed effects estimations are comparable with those of the coefficients of marginal effects from the logistic regressions.

Consistent with the literature, the estimated coefficients on the other explanatory variables display the predicted signs and are statistically significant. In particular, a firm is more likely to buy back shares when it experiences poorer prior stock returns, as suggested by the results from logistic regressions. Also, the likelihood of a repurchase increases in a firm's "permanent" cash flows, "transitory" cash flows, and firm size, and decreases in a firm's capital expenditures and leverage. Overall, we find that firms buy back shares when they face relatively low investor-management agreement. This finding is robust to controlling for other factors that have been shown by the prior literature to affect a firm's repurchase decision.

3.2 Tests of Hypothesis 2

We test this hypothesis by examining how the changes in the agreement proxies are affected by a firm's repurchase based on the following specification:

$$
\begin{aligned}
\textit{Change in Agreement}_{i,t-1 \text{ to } t+1} = {} & \alpha + \beta_1 * \textit{Repurchase}_{i,t} \\
& + \beta_2 * \textit{Controls} (+\mu_i) + \eta_t + \varepsilon_{i,t},
\end{aligned}
\tag{13}
$$

where $Repurchase_{i,t}$ represents the amount of expense on the repurchase (repurchase expense), normalized by firm i's book value of total assets at the year beginning, if the firm conducts a repurchase in year t. Intuitively, the improvement in agreement is greater when the firm buys back more shares, ceteris paribus. If firm i does not repurchase shares in year t, this measure is taken as zero. *Change in Agreement*$_{i,t-1 \text{ to } t+1}$ measures the change in agreement from the year prior (year $t-1$) to the year subsequent (year $t+1$)

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[14] The associated odds ratios from the logistic regressions are 1.263 and 11.773, respectively.

to the repurchase. We explain below in more detail on how we construct this dependent variable.

Consider the proxy proposal dummy first. The change-in-agreement variable is defined as a dummy, which equals one if the proxy proposal dummy takes the value of zero in year $t+1$ and one in year $t-1$, representing an improvement in agreement, and is zero otherwise. Similarly, the agreement, in the case of actual voting in director election being the agreement proxy, is supposed to be improved if no director candidates receive lower votes than the sample median in the director election in year $t+1$, while at least one candidate has below-the-sample-median votes in year $t-1$. As such, it is also defined as a dummy that equals one if the agreement improves from $t-1$ to $t+1$, and is zero otherwise. For the other two agreement proxies—vote recommendation and dual-class control premium—which are continuous as defined, the change in agreement is the simple difference from year $t-1$ to year $t+1$.

When the change-in-agreement is defined as a dummy variable, as is the case for the former two, we apply a logistic model in estimating the effect of the repurchase (and coefficients of the marginal effect are reported), and we expect a significantly positive impact. For the latter two continuous change-in-agreement variables, we employ a firm fixed effects estimation, and we expect that repurchase expense should contribute negatively to the change in agreement. The yearly and industry dummies are included in all regressions, and robust standard errors are clustered at the industry-year level in the logistic regressions and at the firm level in the firm fixed effects regressions.

The results presented in Table 3 strongly support Hypothesis 2. The coefficients of the repurchase expense have the expected signs for all four agreement proxies and are statistically significant. It suggests that the postrepurchase agreement improves and the improvement is greater when firms buy back more shares. Our theory also suggests that improvement in agreement is greater, controlling for the amount spent in the repurchase, if the prerepurchase agreement is lower. We thus conduct an adjusted regression by adding the prerepurchase agreement parameter in the specification (13) and find strong support for the prediction in untabulated results.[15]

3.3 Open-market versus privately negotiated repurchases
The analysis so far takes repurchases as a whole without differentiating between open-market and privately negotiated repurchases. It is reasonable to argue that our agreement theory may fit better with private repurchases than open-market repurchases, especially when the marginal investor holds a large block

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[15] One concern arises that improvement in agreement might be negatively related to the prerepurchase agreement mechanically in our empirical study due to the limitation in using proxies for agreement. For instance, in the case of shareholder proxy proposal as an agreement proxy, the marginal effect of the incidence of receiving a proxy proposal in one year on the incidence of receiving a proposal again in the following years might be well less than one, because shareholders do not submit proposals frequently. As such, we focus on the analysis based on the specification (13).

Table 3
The effect of repurchase on agreement

	Agreement proxies			
	Proxy proposal	Voting recommendation	Actual voting	Dual-class premium
	(1)	(2)	(3)	(4)
Repurchase expense	0.187***	−0.198***	0.057**	−0.397**
	(0.001)	(0.004)	(0.019)	(0.047)
Stock return	0.008	−0.007	0.002	0.036
	(0.159)	(0.204)	(0.578)	(0.273)
Operating performance	−0.085***	0.037	0.002	−0.101
	(0.006)	(0.396)	(0.893)	(0.456)
CAPX	−0.110**	−0.120*	0.034	−0.143*
	(0.048)	(0.058)	(0.259)	(0.089)
Market-to-book	−0.003***	0.002*	−0.000	0.001
	(0.009)	(0.070)	(0.897)	(0.829)
Sales (log)	0.013***	0.009	−0.004***	0.026
	(0.000)	(0.308)	(0.000)	(0.245)
Observations	16,148	14,797	6,813	848
R^2/Pseudo R^2	0.065	0.063	0.111	0.229

This table presents results from logit regressions (Columns (1) and (3)) and firm fixed effects regressions (Columns (2) and (4)) of the impact of repurchase on the change in agreement. The dependent variables, defined as follows, are the changes in the four agreement proxies that are indicated at the top of columns: a dummy that equals one if a firm receives one or more proxy proposals in year $t-1$, but not in year $t+1$, and is zero otherwise; change in the proportion of director candidates receiving a vote-no recommendation from ISS or certain shareholders in a vote-no campaign from year $t-1$ to year $t+1$; a dummy that equals one if there are at least one director candidate receiving fewer votes than the sample median in year $t-1$ and no director candidates receive fewer votes than the sample median in year $t+1$ and is zero otherwise; and change, from year $t-1$ to year $t+1$, in the mean difference in monthly stock price between voting and nonvoting shares in a firm-year divided by the price of nonvoting shares. *Repurchase expense* is the dollar amount of net repurchase at year t if it is positive, divided by the book value of total assets as of the prior year end. Coefficients of the marginal effect are reported in the logit regressions. All regressions include year and industry dummy variables. Robust standard errors are clustered by industry-year in the logit regressions and by firm in the firm fixed effects regressions, and p-values are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

of shares. Inframarginal investors, due to their wealth constraints/risk aversion, may not absorb all shares (given the large size) that the marginal blockholder is willing to sell as she randomizes between selling and holding. Also, both the blockholder and the firm may wish to avoid the stock price pressure imposed by a large block selling on the market. Instead, the blockholder may split the block into small transactions while selling. But such an approach is not very efficient from the standpoint of a manager wishing to increase agreement. As a result, conditional on the decision to repurchase to improve agreement, management may prefer to buy back the whole block of shares owned by the disagreeing blockholder through private negotiations.

To account for management preference for private repurchases relative to open-market repurchases, we modify the baseline analysis by employing an ordered logistic model with the dependent variable being two for private repurchases, one for open-market repurchases, and zero for no repurchases. As discussed in the Appendix, we determine that a firm makes private repurchases in a given year if it announces private repurchases exclusively in that year as reported in SDC and that a firm makes open-market repurchases in a given year if the COMPUSTAT-based measure of net repurchases is positive but

Table 4
The choice between open-market repurchases and privately negotiated repurchases

	Agreement proxies			
	Proxy proposal	Voting recommendation	Actual voting	Dual-class premium
	(1)	(2)	(3)	(4)
Agreement$_{t-1}$	0.132***	0.262***	0.246***	2.407***
	(0.002)	(0.003)	(0.001)	(0.000)
Stock return$_{t-1}$	−0.263***	−0.185***	−0.183***	−0.603***
	(0.000)	(0.000)	(0.001)	(0.007)
Operating income$_{t-1}$	5.378***	4.839***	4.831***	4.045***
	(0.000)	(0.000)	(0.000)	(0.005)
Nonoperating income$_{t-1}$	11.874***	12.906***	10.121***	3.247
	(0.000)	(0.000)	(0.000)	(0.692)
Capital expenditure$_{t-1}$	−5.501***	−6.065***	−6.202***	−4.505***
	(0.000)	(0.000)	(0.000)	(0.006)
Market-to-book$_{t-1}$	−0.030***	0.009	0.019**	−0.047
	(0.000)	(0.203)	(0.019)	(0.234)
Debt ratio$_{t-1}$	−1.697***	−1.583***	−1.502***	−1.592***
	(0.000)	(0.000)	(0.000)	(0.008)
Sales$_{t-1}$ (log)	0.249***	0.323***	0.296***	0.263***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	16295	14828	9748	953
PseudoR^2	0.113	0.133	0.123	0.171

This table presents results from ordered logit regressions, where the dependent variable equals one if the firm makes open-market repurchase in year t, two if the firm makes privately negotiated repurchases in year t, and is zero otherwise. The investor-management agreement proxy used in each regression is indicated at the top of the table. Four measures of agreement are used: *Proxy proposal*, a dummy that equals one if a firm receives one or more proxy proposals in a given year and is zero otherwise; *Voting recommendation*, the proportion of director candidates receiving a vote-no recommendation from ISS or certain shareholders in a vote-no campaign, among all candidates in the firm who are up for the election in a given year; *Actual voting*, a dummy that equals one if there are one or more director candidates who are up for election and receiving fewer votes than the sample median in a given year and is zero otherwise; and *Dual-class control premium*, the mean difference in monthly stock price between voting and nonvoting shares in a firm-year divided by the price of nonvoting shares. All other control variables are defined in the Appendix and are measured as of the year prior to repurchase. All regressions include year and industry dummy variables. Robust standard errors are clustered by industry-year and p-values are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

no private repurchases (as well as self-tender or Dutch auction repurchases) are exclusively reported in that year. The regression results reported in Table 4 confirm the conjecture about the firm's choice discussed above. The coefficients of all four agreement proxies are significantly positive, suggesting that private repurchases are preferred to open-market repurchases when the agreement parameter is low and firms decide to repurchase to improve agreement.

One caveat with our examination pertains to the identification of privately negotiated repurchases. Consistent with the literature, we construct the sample of private repurchases from cases in which firms announce explicitly that only targeted repurchases through private negotiations are being conducted. But firms also often announce repurchase programs without specifying the repurchase mode. Such announcements typically state somewhat ambiguously that the firms will buy back shares on the open market and through private negotiations. We could thus fail to account for those privately negotiated repurchases that are announced simultaneously with open-market repurchases and do occur later. As such, we do not distinguish private repurchases from

open-market repurchases and adopt the COMPUSTAT-based measure of net repurchases (while excluding self-tender and Dutch auction repurchases) throughout the rest of the paper.

3.4 Tests of Hypothesis 3

As we discussed previously, the notion of investor-management disagreement is related to the shareholder heterogeneity argument of Bagwell (1991a, 1991b, 1992) that firms face upward-sloping supply curves for their shares.[16] In our paper, shareholder heterogeneity is due to different propensities on the part of investors to agree with management. The theory requires that not only investors disagree with management but also that different groups of investors have different levels of agreement with management. That is, there must also be differences among investors about the extent to which they disagree with management. If investors disagreed with management but were homogenous in that they always agreed with each other, the firm would gain nothing from a repurchase. But even investors who are homogenous in terms of their propensity to agree with management may disagree with each other on other dimensions that are value relevant. Such difference of opinion, which relates to the ε in our model, is not relevant for the repurchase decision in our analysis, which we will test in this section. The question is: how do we empirically disentangle investor-management disagreement from difference of opinion among investors unrelated to their propensity to endorse management decisions?

Chen, Hong, and Stein (2002), Diether, Malloy, and Scherbina (2002), and Diether (2004) show that dispersion of opinion among investors, combined with short-sale constraints that keep pessimistic investors out of the market, can lead to higher prices and lower subsequent returns (Miller 1977). This implies that, even apart from our theory, a firm is less likely to repurchase its shares when it is overvalued. To distinguish the effect of disagreement from that of this kind of dispersion of opinion, we take the two approaches described below.

First, we directly control for the joint effect of dispersion of opinion and short-sale constraints by including an interaction of the proxies for the two factors in the baseline regressions. Following the prior literature, we use analysts' forecast dispersion as a proxy for dispersion of opinion among investors and short interest as a proxy for the short-sale constraints. A stock is more difficult to short at the margin when there is a higher level of observed short interest. This is because the unobserved demand for short sales increases as the observed short interest rises (Figlewski 1981). D'Avolio (2002) and Boehme, Danielsen, and Sorescu (2006) find that the average cost of shorting a security increases with the level of short interest, so the short-sale constraints related to a security can

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[16] Gay, Kale, and Noe (1991) analyze three repurchase mechanisms under shareholder heterogeneity that include fixed-price tender offer, Dutch auction, and transferable put rights. Gay, Kale, and Noe (1996) derive and test an optimal shareholder bidding strategy under shareholder heterogeneity in a Dutch auction share repurchase.

be viewed as being tighter when a higher level of short interest in the security is observed. We follow the standard practice of scaling the short interest by the number of shares outstanding and take the monthly average of this ratio as an annual observation.

Second, to conduct an additional test, we follow Chen, Hong, and Stein (2002) and include in the baseline regressions a different proxy for dispersion of opinion among investors—breadth of ownership. Specifically, this proxy, labeled as *Breadth of ownership*, is defined as the number of mutual funds that hold a long position in the stock in the quarter as of (or immediately before) the fiscal year-end, divided by the total number of all available mutual funds reporting in the same quarter. This variable proxies for dispersion of opinion among institutional investors—as this dispersion increases, breadth decreases. This proxy has little to do with investor-management disagreement.[17] It also has another advantage in our test of the relation between dispersion of opinion and the repurchase decision. Our analysis in Section 1 suggests that restrictions on short-sales can dampen the repurchase incentive. One may argue that the overvaluation implication of dispersion of opinion may depend on the restrictiveness of the short-sale constraints (see our first approach). But this is not much of a concern in this second approach, because this proxy is constructed based on mutual fund ownership, and mutual funds are typically short-sale constrained.

The results of the logistic regressions are presented in Table 5. They support the hypothesis that it is investor-management disagreement, rather than dispersion of opinion among investors that is unrelated to their propensity to agree with management, that motivates a firm's repurchase decision. The results on all agreement proxies continue to hold with the inclusion of the two proxies for dispersion of opinion among investors. Moreover, controlling for investor-management disagreement, a greater dispersion of opinion among investors, combined with short-sale constraints, is associated with a lower likelihood of a repurchase, consistent with our theory. The coefficients of *Breadth of ownership* are positive and statistically significant in the samples when the three main agreement proxies are used.[18] The coefficients of the interaction term of *Analysts' forecast dispersion* and *Short interest* are significantly negative. The results also suggest that our agreement proxies capture the effect of disagreement between investors and management beyond that generated by difference of opinion among investors unrelated to endorsement of management decisions. The other control variables in the baseline regressions are also included but are not reported here to conserve space.

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[17] Recent papers, for instance, Dittmar and Thakor (2007) and Moeller, Schlingemann, and Stulz (2007), also use this proxy for dispersion of opinion among investors.

[18] It is negative but insignificant in the sample of firms when dual-class control premium is used as an agreement proxy.

Table 5
The effect of difference of opinion among investors on the repurchase decision

| | Agreement Proxies | | | | | | | |
| | Proxy proposal | | Voting recommendation | | Actual voting | | Dual-class premium | |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Agreement$_{t-1}$	0.029***	0.028**	0.060***	0.050**	0.053***	0.054***	0.614***	0.707*
	(0.010)	(0.022)	(0.002)	(0.030)	(0.002)	(0.004)	(0.000)	(0.075)
Breadth of ownership$_{t-1}$	0.651***		1.522***		1.549***		−4.005	
	(0.000)		(0.000)		(0.000)		(0.215)	
Short interest$_{t-1}$*Analysts' forecast dispersion$_{t-1}$		−1.665***		−0.976***		−1.155***		−1.315
		(0.000)		(0.000)		(0.000)		(0.686)
Other controls	yes	yes	yes	yes	yes	yes	yes	yes
Observations	15,922	12,931	14,735	12,096	9,720	8,732	839	233
Pseudo R^2	0.129	0.140	0.148	0.152	0.135	0.142	0.189	0.264

This table presents results from logit regressions, where the dependent variable equals one if the firm makes repurchase in year t and is zero otherwise. The investor-management agreement proxy used in each regression is indicated at the top of the table. Four measures of agreement are used: *Proxy proposal*, a dummy that equals one if a firm receives one or more proxy proposals in a given year and is zero otherwise; *Voting recommendation*, the proportion of director candidates receiving a vote-no recommendation from ISS or certain shareholders in a vote-no campaign, among all candidates in the firm who are up for the election in a given year; *Actual voting*, a dummy that equals one if there are one or more director candidates who are up for election and receiving fewer votes than the sample median in a given year and is zero otherwise; and *Dual-class control premium*, the mean difference in monthly stock price between voting and nonvoting shares in a firm-year divided by the price of nonvoting shares. *Breadth of ownership* is defined, following Chen, Hong, and Stein (2002), as the number of mutual funds who hold a long position in the stock in the quarter as of (or immediately before) the fiscal year-end, divided by the total number of all available mutual funds reporting in the same quarter. *Volatility* is the idiosyncratic volatility of the stock's return in the year. *Analysts' forecast dispersion* is the standard deviation of analysts' earnings-per-share forecasts, denominated by the absolute value of the mean forecast. *Short interest* is the monthly average relative short interest (the ratio of short interest to number of shares outstanding) in a year. Other control variables used in Table 2 are included but not reported here for the sake of brevity. Coefficients of the marginal effect are reported. All regressions include year and industry dummy variables. Robust standard errors are clustered by industry-year and *p*-values are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

4. Distinguishing Disagreement from Information Asymmetry

As we have discussed in the introduction, the information asymmetry/signaling hypothesis is not successful in explaining open-market and private repurchases, either theoretically or empirically. Yet, one could tell a non-signaling-related information asymmetry story to explain a firm's repurchase decision. Consider the following example. A manager decides to invest in a positive-NPV project after doing her due diligence. Investors, however, are uninformed about the value of the project and believe that the project has negative NPV and is being chosen because it produces private benefits for the manager. The stock price thus drops. The manager decides to repurchase the undervalued stock because she has her own equity interest in the firm. This "information asymmetry" story is not necessarily about signaling but has implications similar to our disagreement hypothesis with respect to the negative stock returns prior to the repurchase. We have shown above both theoretically and empirically that the effect of disagreement on the repurchase decision persists after controlling for the prior stock returns. Here, we further delineate our agreement hypothesis from this information asymmetry story more specifically.

Theoretically, the difference between these two stories relates to the conjectured source of disagreement: Under the information asymmetry hypothesis, disagreement arises from access to different information sets, whereas under the disagreement hypothesis, the source is heterogeneous prior beliefs. Empirically, we conduct several discriminating tests on this basis. First, we run an empirical horse race by including, in the baseline regressions, two measures of information asymmetry that are unlikely to be confounded by a link with our main agreement proxies and see if these measures have significant impact on the repurchase decision and how the baseline results on our agreement proxies may be affected. Second, the two hypotheses have distinct implications for the postrepurchase change in agreement and consequently firm valuation. We therefore examine how agreement and firm valuation may be affected differently after repurchases under the two hypotheses.

4.1 Proxies for information asymmetry

As we describe below, we use two proxies for information asymmetry that have been widely used in the literature. The first, labeled as *Volatility*, is the firm's idiosyncratic volatility of stock returns (e.g., Dierkens 1991; Ferreira and Laux 2007; Krishnaswami and Subramaniam 1999; Moeller, Schlingemann, and Stulz 2007). It is defined as the standard deviation of the residuals from a market model regression of the daily stock returns for all trading days in a year.[19] The second, *Earnings residual* (*ER*), is measured as the standard

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[19] The idea behind this variable is that informed trading induces volatility (e.g., Glosten and Milgrom 1985; French and Roll 1986) and idiosyncratic price changes mainly reflect private information being incorporated into stock prices by informed trading (Roll 1988). See Ferreira and Laux (2007) for a reference of empirical evidence in support of this informational interpretation of idiosyncratic volatility.

deviation of all three-day $(-1, +1)$ cumulative abnormal returns (CARs) around earnings announcements over the past five years (e.g., Dierkens 1991; Krishnaswami and Subramaniam 1999; Moeller, Schlingemann, and Stulz 2007). The earnings announcement dates are obtained from I/B/E/S and a minimum of four announcements is required to compute the CARs' standard deviation. We estimate the CARs using the CRSP equally weighted index and the market model, where the parameters for the market model are estimated over the $(-205, -6)$ day interval.[20]

For each of the two information asymmetry measures, we first regress the repurchase decision on the measure alone and then conduct a second regression that includes both the measure of interest and our agreement proxies. The information asymmetry hypothesis predicts that the likelihood of repurchase increases in the two measures of information asymmetry. In all regressions we include the control variables used in the baseline regressions in Table 2, but we do not report them to conserve space. The results, obtained using the logistic model in all regressions, are presented in Table 6.

We find no evidence that this revised information asymmetry story is driving repurchases. Instead, the coefficients of both information asymmetry measures are significantly negative in all samples, except that of the dual-class control premium. However, the results on our agreement proxies hold even after controlling for the information asymmetry measures. Furthermore, we find that the inclusion of our agreement proxies does not alter the economic or statistical significance of the two information asymmetry measures in a significant way. More importantly, the inclusion of the asymmetric information proxies does not affect the economic or statistical significance of the agreement measures.

4.2 Implications for postrepurchase agreement
4.2.1 Impact of elasticity of demand curve on improvement in agreement.
In Section 3.2, we distinguished our disagreement hypothesis from the asymmetric information story by documenting that agreement improves following a repurchase. We now conduct a further test to see how the postrepurchase change in agreement is affected by the demand elasticity for the firm's shares.

The disagreement hypothesis, which posits a negatively sloped share demand curve, implies that the postrepurchase improvement in agreement should be decreasing in the price elasticity of a firm's share demand curve for a given repurchase magnitude. This prediction does not arise from the information asymmetry hypothesis with its flat demand curve. Following Gao and Ritter (2010), we measure the slope of the demand curve using an average daily order flow inverse price elasticity in a year. The daily order flow inverse price

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[20] Intuitively, strong positive or negative reactions by the market around information-revealing events, such as earning announcements, suggest a high information asymmetry between management and investors. So, as in Dierkens (1991), the dispersion in the market reactions over a period is used as a proxy for information asymmetry.

Table 6
The effect of agreement on the repurchase decision: Controls for information asymmetry

Panel A: Idiosyncratic volatility as information asymmetry measure

| | Agreement Proxies | | | | | | | |
| | Proxy proposal | | Voting recommendation | | Actual voting | | Dual-class premium | |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Agreement$_{t-1}$		0.038***		0.054***		0.059***		0.543***
		(0.001)		(0.005)		(0.001)		(0.000)
Volatility$_{t-1}$	−7.502***	−7.516***	−6.927***	−6.953***	−10.234***	−10.262***	−1.494	−1.754
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.324)	(0.255)
Other controls	yes	yes	yes	yes	yes	yes	yes	yes
Observations	16,271	16,271	14,803	14,803	9,728	9,728	930	930
Pseudo R^2	0.140	0.143	0.154	0.156	0.146	0.147	0.154	0.167

Panel B: Earnings residual (ER) as information asymmetry measure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Agreement$_{t-1}$		0.031***		0.042*		0.052***		0.459*
		(0.009)		(0.057)		(0.003)		(0.074)
Earnings residual (ER)$_{t-1}$	−1.823***	−1.827***	−1.366***	−1.370***	−1.581***	−1.593***	−0.073	−0.328
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.965)	(0.848)
Other controls	yes	yes	yes	yes	yes	yes	yes	yes
Observations	13,889	13,889	12,997	12,997	9,270	9,270	272	272
Pseudo R^2	0.141	0.142	0.150	0.151	0.140	0.141	0.272	0.280

This table presents results from logit regressions when two measures of information asymmetry, *Volatility*, and *Earnings residual (ER)*, are included in the baseline regressions in Table 2, respectively. The dependent variable equals one if the firm makes repurchase in year *t* and is zero otherwise. The investor-management agreement proxy used in each regression is indicated at the top of the table. Four measures of agreement are used: *Proxy proposal*, a dummy that equals one if a firm receives one or more proxy proposals in a given year and is zero otherwise; *Voting recommendation*, the proportion of director candidates receiving a vote-no recommendation from ISS or certain shareholders in a vote-no campaign, among all candidates in the firm who are up for the election in a given year; *Actual voting*, a dummy that equals one if there are one or more director candidates who are up for election and receiving fewer votes than the sample median in a given year and is zero otherwise; and *Dual-class control premium*, the mean difference in monthly stock price between voting and nonvoting shares in a firm-year divided by the price of nonvoting shares. *Volatility* is the idiosyncratic volatility of the stock's return in the year. *Earnings residual (ER)* is the standard deviation of the three-day (−1, +1) cumulative abnormal returns around quarterly earnings announcements over the past five years. Other control variables used in Table 2 are included but not reported here for the sake of brevity. Coefficients of the marginal effect are reported. All regressions include year and industry dummy variables. Robust standard errors are clustered by industry-year and industry. *p*-values are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

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Table 7
The effect of repurchase on agreement: The impact of price elasticity

	Agreement proxies			
	Proxy proposal	Voting recommendation	Actual voting	Dual-class premium
Repurchase expense	0.130**	−0.163**	0.048*	−0.362*
	(0.023)	(0.034)	(0.091)	(0.072)
Inelastic demand curve	−0.016***	0.003	−0.001	0.009
	(0.001)	(0.737)	(0.745)	(0.617)
Repurchase expense*	0.240**	−0.401***	0.112**	−0.522
Inelastic demand curve	(0.022)	(0.004)	(0.015)	(0.241)
Stock return	0.008	−0.006	0.002	0.038
	(0.120)	(0.263)	(0.580)	(0.302)
Operating performance	−0.083***	0.046	0.001	−0.231
	(0.007)	(0.285)	(0.930)	(0.118)
CAPX	−0.119**	−0.130*	0.038	−0.309**
	(0.033)	(0.091)	(0.203)	(0.020)
Market-to-book	−0.003***	0.002	0.000	−0.002
	(0.006)	(0.209)	(0.980)	(0.761)
Sales(log)	0.012***	0.008	−0.004***	0.029
	(0.000)	(0.362)	(0.000)	(0.147)
Observations	16,122	14,764	6,777	738
R^2/Pseudo R^2	0.066	0.063	0.115	0.205

This table presents results from logit regressions (Columns (1) and (3)) and firm fixed effects regressions (Columns (2) and (4)) of the impact of repurchase size and price elasticity on the change in agreement. The dependent variables, defined as follows, are the changes in the four agreement proxies that are indicated at the top of columns: a dummy that equals one if a firm receives one or more proxy proposals in year $t-1$, but not in year $t+1$, and is zero otherwise; change in the proportion of director candidates receiving a vote-no recommendation from ISS or certain shareholders in a vote-no campaign from year $t-1$ to year $t+1$; a dummy that equals one if there are at least one director candidate receiving fewer votes than the sample median in year $t-1$ and all director candidates receive no fewer votes than the sample median in year $t+1$ and is zero otherwise; and change, from year $t-1$ to year $t+1$, in the mean difference in monthly stock price between voting and nonvoting shares in a firm-year divided by the price of nonvoting shares. *Repurchase expense* is the dollar amount of net repurchase at year t if it is positive, divided by the book value of total assets as of the prior year end. *Inelastic demand curve* is a dummy that equals one if the firm's price elasticity in a year is above the sample median of that year and is zero otherwise. A firm's price elasticity is the average daily order flow inverse price elasticity in a year, defined as the ratio between the absolute value of the stock's raw return and its turnover (the trading volume divided by the number of shares outstanding). Coefficients of the marginal effect are reported in the logit regressions. All regressions include year and industry dummy variables. Robust standard errors are clustered by industry-year, and p-values are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

elasticity for each trading day is defined as the ratio between the absolute value of the stock's raw return and its turnover (defined as the trading volume divided by the number of shares outstanding). We then obtain the yearly price elasticity by taking the average of the daily elasticity over all the trading days in the year. A firm's stock price is defined as being inelastic in a year if it falls below the sample median of that year.

We augment the model specification in Equation (13) by interacting the repurchase expense variable with the inelastic dummy defined above. The regression results are presented in Table 7. We find that the coefficients of the interaction term have signs consistent with those of the repurchase expense and are statistically significant for all the three main agreement proxies. This finding indicates that, for any given repurchase size, the improvement in agreement is greater when the share demand curve is more inelastic. It thus further buttresses our disagreement hypothesis.

4.2.2 Investor-management disagreement and abnormal stock returns following repurchases. We also distinguish between our disagreement hypothesis and the information asymmetry hypothesis on the basis of their differing implications for abnormal stock returns in both the short and the long run. The nonsignaling information asymmetry hypothesis suggests that managers may exploit stock mispricing, engendered by investors' lack of information, by buying back undervalued shares. But repurchases do not change investor valuation of the firm unless they are a credible signal (but they are not, as discussed previously). In contrast, our disagreement hypothesis implies that an improvement in agreement leads to an increase in stock price. To the extent that the market assigns a positive probability that the announced repurchases will be subsequently implemented and thus computes a positive expected value for future improvements in agreement, we should observe positive abnormal stock returns upon announcements of repurchases. And a lower initial agreement level would lead to a greater expected improvement in agreement for a given size of a repurchase, implying a bigger announcement effect.

Our theory also predicts that the improvement in agreement will be realized only when firms actually implement the announced programs, not when they announce them. Further, as more shares are repurchased over time, agreement between investors and the manager will increase, and the intertemporal improvement in agreement will be reflected in the stock price, resulting in abnormal stock returns over a longer horizon (assuming that not all of the subsequent repurchase activity was completely anticipated at the announcement). That is, if firms do not implement the programs initially announced, we should not observe effects reflected in the long-run abnormal stock returns. But if they do implement the announced programs, then higher postannouncement abnormal returns will be associated with higher amounts of repurchases. Note that this argument does not require that investors be able to "observe" repurchases even ex post, because the source of the long-run returns is the actual increase in agreement, not any information conveyed by the repurchases.

In sum, our disagreement hypothesis predicts that the market, in anticipation of the improvement in agreement, responds positively to a repurchase announcement regardless of whether the repurchase is actually implemented. In the long run, however, the increase in stock price will only be realized when the announced repurchase is implemented. Empirically, in testing the announcement effect, we exploit an institutional-feature distinction between privately negotiated repurchases and open-market repurchases: Firms may or may not subsequently implement the announced open-market repurchases but will definitely implement the private repurchases. That is, holding agreement fixed, we should observe that the market responds more positively to the announcement of a private repurchase than to the announcement of an open-market repurchase because of the anticipated higher probability of implementation.

Due to its most complete coverage of our sample period 1987–2010, we take the sample corresponding to the proxy proposal submission measure of agreement when we examine the short-run and long-run stock price behavior following repurchases.[21] We collect the repurchase announcements by the sample firms from SDC. Lie (2005) documents that most open-market repurchases take place within the quarter and the subsequent quarter of announcements, whereas Stephens and Weisbach (1998) suggest that an open-market repurchase program is usually completed within three years of the announcement. We therefore assert that, for open-market repurchases, the announced programs are actually implemented if firms repurchase shares in total size of at least 0.5% of the firms' prior-year-end market capitalization during the year or/and the subsequent year of the announcements (based on the COMPUSTAT-based measures of net repurchases). Otherwise, the programs are thought of as being not implemented.[22]

Results reported in Table 8 strongly support our disagreement hypothesis. The univariate evidence of cumulative abnormal stock returns (CARs) around announcements in Panel A finds that the market responds positively upon the repurchase announcements in anticipation of the improvement in agreement, while it does not seem to distinguish whether the announced programs will be implemented. We then regress the CARs on *Proxy Proposal* as the agreement proxy, while controlling for *Breadth of ownership* as the proxy for dispersion of opinion among investors, the announced repurchase program size, and other firm characteristics. The results in Column (1) in Panel B of Table 8 show that a lower level of initial agreement leads to higher announcement returns. We further regress the CARs on a private repurchase dummy that equals one if the announced repurchase is privately negotiated, and its interactions with *Proxy proposal* and *Breadth of ownership*, respectively. In Column (2), we find that the agreement-private repurchase interaction is significantly positive, whereas the interaction of dispersion of opinion and private repurchase is not. That is, private repurchases announced following a lower agreement level, compared with otherwise similar open-market repurchases, experience significantly higher CARs. It suggests that the market expects a greater improvement in agreement with private repurchases than with open-market repurchases. Moreover, the market also responds more positively to larger announced program sizes in smaller firms.

Further, as shown in Panel A, we find significantly positive long-run buy-and-hold abnormal returns (BHARs) following repurchase announcements on average, but the abnormal performance is limited to firms that actually implement the announced repurchases. The multivariate analysis of BHARs

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[21] We also conduct a robustness check using the samples of the other two main agreement proxies. Our conclusion is not qualitatively affected.

[22] We impose this more stringent criterion—0.5% of the market capitalization—following the literature (e.g., Lie 2005; Gong, Louis, and Sun 2008) to rule out the potential cases in which firms have repurchased preferred stock and nonstock securities. Our results, however, are not affected by whether or not this criterion is imposed.

on the whole sample, as shown in the Column (3) of Panel B, suggests that the abnormal performance is positively related to how much the firms actually repurchase. And this relationship is not merely driven by the lack of significant performance in firms that do not implement the announced programs. As we show in the Column (4) of Panel B, among those firms that do actually implement the programs, better abnormal performance is associated with the firms that conduct larger repurchases.

One may argue that a positive market response around the repurchase announcements and in the long run (with the market underreaction assumption) is also consistent with an agency-problem explanation. Investors may believe that the cash payout through repurchases mitigates the agency problem of free cash flow and thus reduces the likelihood of managers investing in negative-NPV projects to which they originally objected before the repurchases. We investigate this alternative explanation by regressing the announcement returns on a proxy for agency problems, the announced repurchase size, and their interaction, as well as other control variables used in the above tests. If the agency explanation holds, we should observe higher CARs associated with a larger announced repurchase size when the agency problem is more severe. Similarly, we conduct this test on the long-run abnormal returns, while replacing the announced repurchase size with the actual repurchase size. We proxy for a firm's agency problem by defining a dummy variable, which equals one if the number of antitakeover provisions in a firm (i.e., the GIM index in Gompers, Ishii, and Metrick (2003)) exceeds the sample median and the proportion of independent directors on its board is below the sample median. Intuitively, a firm is viewed as having a more severe agency problem if this dummy equals one. In untabulated results, we do not find any evidence in support of this agency explanation in either the announcement returns or the long-run abnormal returns.

In sum, the evidence provides stronger support for our disagreement hypothesis than other hypotheses. Moreover, although we do not rule out the market-timing hypothesis, our disagreement hypothesis has incremental power in explaining a firm's repurchase decision.

Table 8
Repurchases and Abnormal Stock Returns

Panel A: Univariate evidence of CARs and BHARs

		Overall	Implemented	Not implemented
CARs	Mean	0.84***	0.92***	0.65***
	Median	0.65***	0.69***	0.52***
	Obs.	3,180	2,501	679
BHARs	Mean	6.16***	8.75***	−0.16
	Median	1.89**	2.06**	0.26
	Obs.	3,051	2,430	621

(*continued*)

Table 8
Continued

Panel B: Multivariate regressions of CARs and BHARs

	CAR overall	CAR overall	BHAR overall	BHAR implemented
	(1)	(2)	(3)	(4)
Announced program size$_t$	0.076***	0.074***		
	(0.000)	(0.000)		
Actual repurchase size$_t$			1.594***	1.029*
			(0.006)	(0.082)
Stock return$_{t-1}$	−0.005	−0.005*	−0.037	−0.063
	(0.101)	(0.097)	(0.553)	(0.434)
Sales$_{t-1}$ (log)	−0.003***	−0.003***	−0.021	−0.035**
	(0.001)	(0.001)	(0.130)	(0.031)
Debt ratio$_{t-1}$	−0.002	−0.003	−0.062	−0.163
	(0.809)	(0.703)	(0.710)	(0.395)
Operating income$_{t-1}$	0.002	0.002	0.877**	0.458
	(0.898)	(0.899)	(0.015)	(0.252)
Non-operating income$_{t-1}$	0.142	0.130	2.541	1.445
	(0.109)	(0.141)	(0.200)	(0.546)
Market-to-book$_{t-1}$	0.000	0.000	−0.005	−0.010
	(0.818)	(0.800)	(0.566)	(0.275)
Capital expenditure$_{t-1}$	−0.016	−0.013	0.332	0.067
	(0.611)	(0.676)	(0.587)	(0.927)
Agreement$_{t-1}$	0.005**	0.004*		
	(0.027)	(0.064)		
Private repurchase$_t$		0.007		
		(0.263)		
Agreement$_{t-1}$*Private repurchase$_t$		0.019*		
		(0.071)		
Breadth of ownership$_{t-1}$	0.038	0.042*		
	(0.125)	(0.083)		
Breadth of ownership$_{t-1}$*Private repurchase$_t$		−0.065		
		(0.442)		
Observations	3,175	3,175	3,051	2,430
R^2	0.045	0.049	0.040	0.049

This table reports evidence on the short-run and long-run abnormal stock returns.

Panel A presents univariate results of the two-day (−1, 0) cumulative abnormal returns (CARs) around the repurchase announcements and the two-year buy-and-hold abnormal returns (BHARs) following the announcements for the whole sample and two subsamples of whether the announced repurchase programs are actually implemented. All announced privately negotiated repurchases are implemented by definition. For open-market repurchases, it is determined that the announced programs are actually implemented if firms repurchase shares in total of the size of at least 0.5% of the firms' prior-year-end market capitalization during the year or/and the subsequent year of the announcements (based on the COMPUSTAT-based measures of net repurchases). Otherwise, the programs are thought of as being not implemented.

Panel B presents results of OLS regressions of CARs and BHARs. The dependent variable is the CARs in the first two columns, where the whole sample of firms is estimated. The dependent variables are the BHARs in the last two columns, where the overall sample and the subsample of firms that actually implement the announced repurchase programs are used, respectively. The agreement proxy used here is the proxy proposal dummy that equals one if a firm receives one or more proxy proposals in a given year and is zero otherwise. *Announced program size* is the announced repurchase size as a percentage of the firm's market capitalization as of the prior year end. *Actual repurchase size* is the actual repurchase expense in the year and the subsequent year of the announcement, denominated by the firm's market capitalization as of the prior year end; it is zero if no repurchases are made in the two years. *Private repurchase* is a dummy that equals one for privately negotiated repurchases and is zero for open-market repurchases. *Breadth of ownership* is defined, following Chen, Hong, and Stein (2002), as the number of mutual funds who hold a long position in the stock in the quarter as of (or immediately before) the fiscal year end, divided by the total number of all available mutual funds reporting in the same quarter. All regressions include year and industry dummy variables. Robust standard errors are clustered by industry-year, and *p*-values are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

5. Discussions and Other Robustness Checks

5.1 Executive financial incentives

One stream of research on corporate payout policy relates the surge in repurchases in the 1990s to the increased use of stock options to compensate management and employees or to reduce dilution from employee stock option plans (e.g., Babenko 2009; Fenn and Liang 2001; Kahle 2002; Weisbenner 2004). In our study, we measure repurchases net of any associated stock reissuance used in employee stock ownership and executive stock option plans or used to fund a merger or other corporate activities. Thus, our disagreement explanation of repurchases is unlikely to be affected by dilution-reduction considerations. For robustness, however, we examine the impact of managers' financial incentives on our disagreement explanation.

We measure managers' financial incentives using the firm's top five executives' stock ownership and unexercised stock options that were vested and thus exercisable. We obtain data on these variables from ExecuComp, which results in a significant drop in sample size. We find that our results, untabulated for brevity, hold for all the agreement proxies. Further, consistent with the literature, the coefficients on management stock ownership are significantly negative, while those on stock options are significantly positive, suggesting that managers are more likely to buy back shares when they have lower stock ownership and more unexercised (exercisable) stock options.

5.2 Alternative interpretations

The results strongly indicate that it is investor-management disagreement, rather than asymmetric information, that drives repurchases. We now examine alternative interpretations of our results. The purpose is not to rule out these other interpretations per se, but rather to assess whether investor-management disagreement has incremental power to explain a firm's repurchase decision, relative to the other explanations.

5.2.1 Financial flexibility view. One influential view of why repurchases are preferred to dividends in a firm's payout mix is the greater financial flexibility of repurchases (e.g., Jagannathan, Stephens, and Weisbach 2000; Guay and Harford 2000). Prior evidence shows that firms with higher "temporary," nonoperating cash flows tend to choose repurchases, while those with higher "permanent" operating cash flows pay dividends. Repurchasing firms are also shown to have more volatile cash flows. Thus, the relation between repurchase decisions and investor-management disagreement may be driven by a possible relation between cash flow volatility and disagreement.

To address this issue, we perform two checks. First, we control for operating cash flows and nonoperating cash flows. The estimated coefficients, as shown in Table 2, take the expected signs and are highly significant in the different specifications. Second, in untabulated analysis, we focus on firms with below-median volatility of cash flows and re-examine the relationship between

repurchases and disagreement for this subset of firms. Volatility of cash flows is calculated as the standard deviation of a firm's cash flows over the past five years. We find that the relationship between disagreement and repurchase decisions is robust for this subset of firms. Overall, the results indicate that, even when financial flexibility is less likely to be a factor in driving a firm's repurchase decision, the effect of investor-management disagreement persists.

5.2.2 Growth opportunities.   Another potential concern is that the relationship between repurchase decisions and disagreement may arise simply because firms with limited growth opportunities may choose to repurchase in order to pay out cash that they do not need for investment. This argument is consistent with the survey evidence in Brav et al. (2005), who suggest that managers make repurchase decisions after investment decisions. To the extent that this is true, the documented relationship between investor-management disagreement and repurchases may be merely a reflection of a firm's limited investment opportunities.

This issue is partly addressed by the fact that we control for investment opportunities using market-to-book ratios. However, because the market-to-book ratio is an imprecise proxy for investment opportunities, interpretation of the results is a little murky. To tackle this measurement issue, we follow Datta, Iskandar-Datta, and Raman (2001) and use the preceding three-year sales growth of a firm as an additional proxy for investment opportunities. In particular, we split the sample into high- and low-growth groups based on this new proxy, and then we repeat the baseline analysis replacing market-to-book with the new proxy.

In untabulated analysis, we find that for firms in the low-growth group, the results hold for our main agreement proxies. Further, for the firms in the high-growth group, the effect of disagreement on repurchases remains. These findings suggest that investor-management disagreement is not specific to low-growth firms, because if it were, we would not see any impact of disagreement in high-growth firms. These results suggest that while a repurchase may be used as a conventional payout mechanism by low-growth firms that wish to disgorge excess cash, it is also used strategically to improve agreement between investors and management, regardless of the firm's growth prospects.

6. Conclusion

In this paper we develop a new theoretical explanation for open-market and privately negotiated share repurchases and provide supporting empirical evidence. We also provide a link between a firm's share repurchase decision and its investment decision. When investors disagree with management about investment decisions, the firm's stock price is adversely affected. However, by repurchasing shares, a firm causes ownership to concentrate in the hands of investors more likely to agree with management, as investors less prone to agree

with management tender their shares when the firm repurchases. This positively affects the firm's stock price. We thus posit that sufficiently low investor-management disagreement triggers a repurchase. Our empirical evidence strongly supports this motive for stock repurchases. We also distinguish empirically between this disagreement explanation and other explanations like agency and non-signaling-related information-asymmetry motivations and document that our findings are robust.

In the previous literature (e.g., Allen and Gale 1999; Dittmar and Thakor 2007; Van den Steen 2004, 2010b), the extent of disagreement has been taken as exogenously given. Our findings show that firms may take steps to strategically affect the level of agreement through initiatives like repurchases. Other initiatives may include the choice of financing source, like bank financing, that may potentially reduce disagreement; an analysis of this may provide an alternative to information-based theories of financial intermediation (e.g., Ramakrishnan and Thakor 1984). Future research could explore other implications of this and other proactive firm initiatives.

Appendix

A. Variable definitions

A.1 Share repurchases
Following the approach of Fama and French (2001) and Skinner (2008), our measure of share repurchases nets out stock reissuances used in employee stock ownership and executive stock option plans or in payment to fund acquisition or other corporate activities.[23] Specifically, if the firm uses the treasury stock method for repurchases, we measure repurchases for year t as the change in common treasury stock (COMPUSTAT item 226) from year $t-1$ to year t. If the firm uses the retirement method instead, which is inferred from treasury stock equal to zero in the current and prior years, we take repurchases for year t to be the difference between purchases (COMPUSTAT item 115) and sales (COMPUSTAT item 108) of common and preferred stock in year t. If either of these amounts is negative, we set repurchases to zero. Because we are focusing on open-market and privately negotiated repurchases in this study, in firm-years with positive calculated repurchases under the above approach, we set repurchases to zero in the identical firm-years in which self-tender offer or Dutch auction repurchases are identified to have occurred according to SDC.[24]

In the analysis in which we need to distinguish between open-market and privately negotiated repurchases, we follow Peyer and Vermaelen (2005) in identifying the subsample of privately negotiated repurchases. Specifically, we collect all these repurchases from SDC's database on mergers and acquisitions with complete information on the announcement date, the repurchase

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[23] By using net repurchases instead of raw repurchases, we focus on repurchases that are less likely to be motivated by undoing the EPS dilution associated with stock options (e.g., Kahle 2002; Weisbenner 2004) or by funding firms' acquisitions or pension plans.

[24] Identifying an accurate measure of repurchases is empirically difficult. Banyi, Dyl, and Kahle (2008) find higher error rates in commonly used estimators of share repurchases. Our measure here is an approximation of open-market and privately-negotiated repurchases, as it may also include repurchases of securities other than common stock. Despite being rare, we may have also omitted those open-market or privately negotiated repurchases made in the same year of self-tender offer or Dutch auction repurchases. However, the prior literature (e.g., Stephens and Weisbach 1998; Jagannathan, Stephens, and Weisbach 2000; Grullon and Michaely 2002) suggests that transactions other than open-market repurchases represent only a small fraction of firms' repurchase activity.

price per share, and the fraction of shares repurchased. We further require, as their study does, that no other repurchase programs are announced simultaneously.

A.2 Investor-management agreement

A.2.1 Whether a firm receives one or more proxy proposals in a given year.
When investors disagree, they may press for changes through private negotiations with management. But if management is not sufficiently responsive or the negotiation fails, investors may submit proxy proposals for a shareholder vote. Our first proxy for agreement exploits this idea. The literature (e.g., Gillan and Starks 2000; Renneboog and Szilagyi 2011; Thomas and Cotter 2007) shows that public and union pension funds, investment firms, and coordinated investors are among the most active sponsors of proxy proposals. The issues addressed in such proposals include, but are not limited to, shareholder voting, takeovers, selection of directors, executive compensation, and the sale of the company. Despite the nonbinding nature of voting on shareholder proxy proposals, proposal submission sponsored by shareholders is a conspicuous sign of investor-management disagreement. We capture such disagreement using a dummy variable that equals one if a firm receives one or more shareholder proxy proposals in a given year and is zero otherwise.[25]

Of course, we are not suggesting that an absence of shareholder proxy proposals implies that investors' beliefs are always aligned with the firm's management. Some unobservable factors may prevent investors from choosing to submit proxy proposals in some firms at any time when they disagree with management. Therefore, we do not make cross-sectional comparisons to examine whether investors in some firms are more likely to disagree with management than investors in other firms on the basis of whether or not they submit proxy proposals. Rather, we focus on firms that have received at least one shareholder proxy proposal over the sample period. And we argue that investors are more likely to disagree with management in the years they submit proxy proposals than in the years in which they do not. Our final sample in using shareholder proxy proposal as an agreement proxy covers 1,198 firms and 16,295 firm-years from 1987 to 2010.

A.2.2 Vote recommendations in director election.
Our second and third proxies for agreement exploit the fact that shareholders can signal their disagreement with management in the case of director elections. Before a director election, some investors may organize a campaign against one or more director candidates to be elected, encouraging fellow shareholders via letters, press release, or internet communications to withhold votes for the candidate(s). Such shareholder-initiated "just vote no" campaigns are augmented more recently by "vote no" recommendations issued by third-party proxy advisors like Institutional Shareholder Services (ISS). From the data provided by Voting Analytics (a product of ISS), every year since 2003, ISS issues vote recommendations for all director candidates who are up for election in most of the Russell 1000 firms and many of the Russell 2000 firms. The recommendations are either "for" or "withhold" ("against").

Therefore, our second agreement proxy relates to the extent to which a firm's director candidates will receive objections from shareholders or independent proxy advisors *before* the election. To account for the difference in the number of director candidates who are up for election in different firm-years, we define the measure as the proportion of director candidates receiving a "withhold" or "against" recommendation from ISS or/and certain shareholders in a "just vote no" campaign, among all candidates in the firm who are up for election in a given year. The greater the magnitude of this measure, the more likely are shareholders to disagree with management. Note that this measure takes most weight from the ISS recommendation, because shareholders' "just vote no" campaigns are still relatively rarely observed despite their increasing popularity since inception in 1990.[26] And in most cases of shareholder campaigns against certain candidates, ISS is observed to

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[25] Proxy proposals can be broadly classified into two types: governance-related vs. social responsibility-related (typically submitted by religious/socially responsible investors). In this study, we focus on the former type only.

[26] Del Guercio, Seery, and Woidtke (2008) identify 112 "just vote no" campaigns from 1990 to 2003, while we find 186 such campaigns from 2004 to 2010.

issue "withhold" or "against" recommendation on these candidates too. Our final sample in using this agreement measure spans 2,546 firms and 14,828 firm-years during 2003–2010, a period when ISS has full coverage of director vote recommendations.

A.2.3 Actual voting in director elections. The third proxy considers actual shareholder voting *during* the director election. Intuitively, shareholders may express their disagreement by withholding votes for or voting against certain candidates in the election of directors. Candidates are normally elected with high "for" votes. For instance, Cai, Garner, and Walkling (2009) find that an average director across all firms receives just over 94% of the "for" votes for the period of 2003–2005. Given the high percentage of "for" votes in normal times, an even slightly lower vote may signal shareholders' disagreement. We therefore define a disagreement proxy as a dummy that equals one when at least one director candidate in a firm receives a below-the-sample-median "for" votes in a given year and is zero otherwise, where the sample median is the median vote of all director candidates for all firms in that year. Alternatively, we define the third proxy as the proportion of director candidates receiving below-the-sample-median "for" votes in a given firm-year; all the results are qualitatively similar with this alternative measure. The final sample with the third agreement proxy covers 2,351 firms and 9,748 firm-years from 2003 to 2010.[27]

A.2.4 Dual-class control premium. Following Dittmar and Thakor (2007), we use the control premium for dual-class stock as an alternative proxy for agreement. Due to limited data availability, however, we focus on the three proxies discussed above and use this proxy only in a robustness check.

Firms with dual-class ownership structures typically have two share classes that have equal cash flow rights, but the insider-held voting stock has more voting or control rights and thus trades at a premium relative to the widely held nonvoting stock. The difference in the prices at which voting and nonvoting shares trade represents the value of voting. Of course, the right to vote has value only if there is a nonzero probability that one may vote against management. A shareholder who is certain to endorse every managerial decision has no reason to pay extra for the right to vote. In contrast, the more likely a shareholder is to disagree with management, the higher the value the shareholder will attach to the right to vote. Thus, we predict that a dual-class firm is more likely to conduct repurchases when the control premium is higher.

To measure a firm's control premium, we need to have the prices of the two classes of stock, and hence we focus on firms with dual-class stock when both classes trade. After imposing the sampling restrictions as discussed in Section 2.1, we obtain a sample of 141 firms with dual-class stock trading in 995 firm-years. Using CRSP monthly pricing data, we measure the control premium as the superior stock price minus the inferior stock price divided by the inferior stock price for a given month. We then take the average of the monthly premium for each firm-year to arrive at an annual control premium for the firm. For robustness, we also use the median of the monthly premium; we find that the results are largely unaffected.

Dittmar and Thakor (2007) argue persuasively that the dual-class control premium is more appropriately viewed as a proxy for investor-management disagreement than as a proxy for agency problems. Nevertheless, we conduct a further check of whether agency problems can explain the control premium. In cross-sectional studies, Masulis, Wang, and Xie (2009) and Gompers, Ishii, and Metrick (2010) suggest that managers are more prone to pursue private benefits at shareholders' expense, and thus firm value is lower when the divergence between insider control rights and cash flow rights is greater. We thus examine whether the intertemporal variation of the control premium can be explained by the intertemporally varying degrees of divergence between control rights and cash flow rights within a firm. We find that the magnitude of the divergence between control and

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[27] This sample size is smaller than that of the vote recommendation sample due to the missing information in actual votes for many firm-years.

cash flow rights changes far less than does the control premium over time in a firm. Therefore, the within-firm variation in the control premium is unlikely to be due to agency problems for which we can control in a firm fixed effects estimation. Besides the data availability limitation, a concern with this control premium measure for agreement is that it is derived from the firm's stock price, making it somewhat difficult to disentangle our agreement hypothesis from the market-timing hypothesis. We try to address this issue by controlling for the prior stock returns in the regressions.[28]

A.3 Other variables

- *Actual repurchase size* is defined as follows: for open-market repurchases, the total repurchase expense during the two years as a percentage of the firm's market capitalization as of the year end prior to the announcement; for private repurchases, since they are always implemented within a short time period following the announcements, we use the announced amount (or number of shares to be repurchased) in determining the actual repurchase size.
- *Analysts' forecast dispersion* is the standard deviation of analysts' earnings-per-share forecasts, denominated by the absolute value of the mean forecast.
- *Announced program size* is the announced repurchase size as a percentage of the firm's market capitalization as of the prior fiscal year end (or as a percentage of the firm's total number of shares outstanding if the number of shares to be repurchased is announced).
- *BHARs* are the buy-and-hold abnormal returns (BHARs) relative to control firms for a period of two years following the repurchase announcements (to be roughly consistent with the actual repurchase measurement period). They are defined following Barber, Lyon, and Tsai (1999). The control firms are matched on size, book-to-market, and prior six-month returns.
- *Breadth of ownership* is defined, following Chen, Hong, and Stein (2002), as the number of mutual funds who hold a long position in the stock in the quarter as of (or immediately before) the fiscal year-end, divided by the total number of all available mutual funds reporting in the same quarter.
- *Capital expenditures* is the ratio of capital expenditures to the book value of total assets.
- *CARs* are the two-day (-1, 0) cumulative abnormal stock returns around repurchase announcements, estimated with the market model.
- *Debt ratio* is the long-term debt divided by the book value of total assets.
- *Earnings residual* (*ER*) is the standard deviation of the three-day $(-1, +1)$ cumulative abnormal returns around quarterly earnings announcements over the past five years.
- *Frequency* is the proportion of years that a firm has positive net repurchase in the sample period.
- *Inelastic demand curve* is a dummy that equals one if the firm's price elasticity in a year is above the sample median of that year and is zero otherwise. A firm's price elasticity is the average daily order flow inverse price elasticity in a year, defined as the ratio between the absolute value of the stock's raw return and its turnover (the trading volume divided by the number of shares outstanding).
- *Nonoperating income* is the ratio of nonoperating income (COMPUSTAT item 61) to the book value of total assets.
- *Operating income* is the ratio of operating income to the book value of total assets.
- *Repurchase expense* is the dollar amount of net repurchase if it is positive, divided by the book value of total assets as of the prior fiscal year end.
- *Sales* (*log*) is the log of sales.
- *Short interest* is the monthly average relative short interest ratio (short interest divided by the total number of shares outstanding) in a year.

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[28] Recall that the stock price in our model depends on both manager-investor agreement and the noise term ε.

- *Volatility* is the idiosyncratic volatility of the stock's return in the year, which is the standard deviation of residuals obtained from regressing the firm's raw daily stock return on the contemporaneous value-weighted CRSP stock return in a year.

References

Allen, F., and D. M. Gale. 1999. Diversity of opinions and financing of new technologies. *Journal of Financial Intermediation* 8:68–89.

Allen, F., and R. Michaely. 2003. Payout policy. In *Handbook of the economics of finance*. Eds. G. Constandinides, M. Harris, and R. Stulz. North-Holland: Elsevier.

Asquith, P., and D. Mullins. 1986. Signaling with dividends, stock repurchases and equity issues. *Financial Management* 15:27–44.

Babenko, I. 2009. Share repurchases and pay-performance sensitivity of employee compensation contracts. *Journal of Finance* 64:117–51.

Babenko, I., Y. Tserlukevich, and A. Vedrashko. 2012. The credibility of open market share repurchase signaling. *Journal of Financial and Quantitative Analysis* 47:1059–88.

Bagwell, L. S. 1991a. Share repurchase and takeover deterrence. *Rand Journal of Economics* 22:72–88.

———. 1991b. Shareholder heterogeneity: Evidence and implications. *American Economic Review* 81:218–21.

———. 1992. Dutch auction repurchases: An analysis of shareholder heterogeneity. *Journal of Finance* 47:71–105.

Banyi, M. L., E. A. Dyl, and K. M. Kahle. 2008. Errors in estimating share repurchases. *Journal of Corporate Finance* 14:460–74.

Barber, B., J. Lyon, and C. Tsai. 1999. Improved methods for tests of long-run abnormal stock returns. *Journal of Finance* 54:165–201.

Bargeron, L., M. Kulchania, and S. Thomas. 2011. Accelerated share repurchases. *Journal of Financial Economics* 101:69–89.

Boehme, R., B. Danielsen, and S. Sorescu. 2006. Short sale constraints, difference of opinion, and overvaluation. *Journal of Financial and Quantitative Analysis* 41:455–87.

Boot, A., R. Gopalan, and A. Thakor. 2006. The entrepreneur's choice between private and public ownership. *Journal of Finance* 61:803–36.

———. 2008. Market liquidity, investor participation and managerial autonomy: Why do firms go private? *Journal of Finance* 63:2013–59.

Boot, A., and A. Thakor. 2011. Managerial autonomy, allocation of control rights, and optimal capital structure. *Review of Financial Studies* 24:3434–85.

Brav, A., J. R. Graham, C. R. Harvey, and R. Michaely. 2005. Payout policy in the 21st century. *Journal of Financial Economics* 77:483–527.

Brennan, M., and A. Thakor. 1990. Shareholder preferences and dividend policy. *Journal of Finance* 45:993–1018.

Brockman, P., and D. Y. Chung. 2001. Managerial timing and corporate liquidity: Evidence from actual share repurchases. *Journal of Financial Economics* 61:417–48.

Cai, J., J. Garner, and R. Walkling. 2009. Electing directors. *Journal of Finance* 64:2389–421.

Chemmanur, T., Y. Cheng, and T. Zhang. 2010. Why do firms undertake accelerated share repurchase programs? Working Paper, Boston College.

Chen, J., H. Hong, and J. Stein. 2002. Breadth of ownership and stock returns. *Journal of Financial Economics* 66:171–205.

Chetty, R., and E. Saez. 2005. Dividend taxes and corporate behavior: Evidence from the 2003 dividend tax cut. *Quarterly Journal of Economics* 120:791–833.

———. 2006. The effects of the 2003 dividend tax cut on corporate behavior: Interpreting the evidence. *American Economic Review Papers and Proceedings* 96:124–9.

Comment, R., and G. Jarrell. 1991. The relative signaling power of Dutch-auction and fixed-price self-tender offers and open market share repurchases. *Journal of Finance* 46:1243–71.

Constantinides, G., and B. Grundy. 1989. Optimal investment with stock repurchase and financing as signals. *Review of Financial Studies* 2:445–65.

Cook, D., L. Krigman, and J. C. Leach. 2004. On the timing and execution of open market repurchases. *Review of Financial Studies* 17:463–98.

Coval, J. D., and A. Thakor. 2005. Financial intermediation as a belief-bridge between optimists and pessimists. *Journal of Financial Economics* 75:535–69.

Dann, L. 1981. The effects of common stock repurchase on security holder's returns. *Journal of Financial Economics* 9:101–38.

Datta, S., M. Iskandar-Datta, and K. Raman. 2001. Executive compensation and corporate acquisition decisions. *Journal of Finance* 56:2299–336.

D'Avolio, G. 2002. The market for borrowing stock. *Journal of Financial Economics* 66:271–306.

DeAngelo, H., L. DeAngelo, and D. J. Skinner. 2004. Are dividends disappearing? Dividend concentration and the consolidation of earnings. *Journal of Financial Economics* 72:425–56.

———. 2008. Corporate payout policy. *Foundations and trends in finance*, vol. 3, nos. 2–3, 95–287.

Del Guercio, D., L. Seery, and T. Woidtke. 2008. Do boards pay attention when institutional investor activists 'just vote no'? *Journal of Financial Economics* 90:84–103.

Deshmukh, S., A. Goel, and K.M. Howe. 2013. CEO overconfidence and dividend policy. *Journal of Financial Intermediation* 22:440-63.

Dierkens, N. 1991. Information asymmetry and equity issues. *Journal of Financial and Quantitative Analysis* 26:181–200.

Dittmar, A. 2000. Why do firms repurchase stock? *Journal of Business* 73:331–55.

Dittmar, A., and R. Dittmar. 2008. The timing of financing decisions: An examination of the correlation in financing waves. *Journal of Financial Economics* 90:59–83.

Dittmar, A., and A. Thakor. 2007. Why do firms issue equity? *Journal of Finance* 62:1–54.

D'Mello, R., and P. Shroff. 2000. Equity undervaluation and decisions related to repurchase tender offers: An empirical investigation. *Journal of Finance* 55:2399–424.

Diether, K. 2004. Long-run event performance and opinion divergence. Working Paper, Ohio State University.

Diether, K., C. Malloy, and A. Scherbina. 2002. Differences of opinion and the cross-section of stock returns. *Journal of Finance* 57:2113–41.

Fama, E., and K. French. 2001. Disappearing dividends: Changing firm characteristics or lower propensity to pay? *Journal of Financial Economics* 60:3–43.

Fenn, G. W., and N. Liang. 2001. Corporate payout policy and managerial stock incentives. *Journal of Financial Economics* 60:45–72.

Ferreira, M., and P. Laux. 2007. Corporate governance, idiosyncratic risk, and information flow. *Journal of Finance* 62:951–89.

Figlewski, S. 1981. The informational effect of restrictions on short sales: Some empirical evidence. *Journal of Financial and Quantitative Analysis* 16:463–76.

French, K., and R. Roll. 1986. Stock return variance: The arrival of information and the reaction of traders. *Journal of Financial Economics* 17:5–26.

Gao, X., and J. Ritter. 2010. The marketing of seasoned equity offerings. *Journal of Financial Economics* 97:33–52.

Garmaise, M. 2001. Rational beliefs and security design. *Review of Financial Studies* 14:1183–213.

Gaspar, J., M. Massa, P. Matos, R. Patgiri, and Z. Rehman. 2013. Payout policy choices and shareholder investment horizons. *Review of Finance* 17:261–320.

Gay, G., J. Kale, and T. Noe. 1991. Share repurchase mechanisms: A comparative analysis of efficacy, shareholder wealth, and corporate control effects. *Financial Management* 20:44–59.

———. 1996. Dutch auction share repurchases. *Economica* 63:57–80.

Gillan, S. L., and L. T. Starks. 2000. Corporate governance proposals and shareholder activism: The role of institutional investors. *Journal of Financial Economics* 57:275–305.

Glosten, L., and P. Milgrom. 1985. Bid, ask, and transaction prices in a specialist market with heterogeneously informed traders. *Journal of Financial Economics* 14:71–100.

Gompers, P. A., J. L. Ishii, and A. Metrick. 2003. Corporate governance and equity prices. *Quarterly Journal of Economics* 118:107–56.

———. 2010. Extreme governance: An analysis of dual-class firms in the United States. *Review of Financial Studies* 23:1051–88.

Gong, G., H. Louis, and X. Sun. 2008. Earnings management and firm performance following open-market repurchases. *Journal of Finance* 63:947–85.

Grullon, G., and R. Michaely. 2002. Dividends, share repurchases, and the substitution hypothesis. *Journal of Finance* 57:1649–84.

———. 2004. The information content of share repurchase programs. *Journal of Finance* 59:651–80.

Guay, W., and J. Harford. 2000. The cash flow permanence and information content of dividend increases vs. repurchases. *Journal of Financial Economics* 57:385–415.

Jagannathan, M., C. P. Stephens, and M. S. Weisbach. 2000. Financial flexibility and the choice between dividends and stock repurchases. *Journal of Financial Economics* 57:355–84.

Kahle, K. M. 2002. When a buyback isn't a buyback: Open market repurchases and employee options. *Journal of Financial Economics* 63:235–61.

Kandel, E., and N. D. Pearson. 1995. Differential interpretation of public signals and trade in speculative markets. *Journal of Political Economy* 103:831–72.

Krishnaswami, S., and V. Subramaniam. 1999. Information asymmetry, valuation, and the corporate spin-off decision. *Journal of Financial Economics* 53:73–112.

Lie, E. 2005. Operating performance following open market share repurchase announcements. *Journal of Accounting and Economics* 39:411–36.

Lie, E., and J. J. McConnell. 1998. Earnings signals in fixed-price and Dutch auction self-tender offers. *Journal of Financial Economics* 49:161–86.

Louis, H., and H. White. 2007. Do managers intentionally use repurchase tender offers to signal private information? Evidence from firm financial reporting behavior. *Journal of Financial Economics* 85:205–33.

Masulis, R., C. Wang, and F. Xie. 2009. Agency problems in dual-class companies. *Journal of Finance* 64:1697–727.

Maxwell, W., and C. Stephens. 2003. The wealth effects of repurchases on bondholders. *Journal of Finance* 58:895–919.

Miller, E. 1977. Risk, uncertainty and divergence of opinion. *Journal of Finance* 32:1151–68.

Modigliani, F., and M. H. Miller. 1958. The cost of capital, corporate investment and the theory of investment. *American Economic Review* 48:261–97.

Moeller, S., F. Schlingemann, and R. Stulz. 2007. How do diversity of opinion and information asymmetry affect acquirer returns? *Review of Financial Studies* 20:2047–78.

Oded, J. 2005. Why do firms announce open market repurchase programs? *Review of Financial Studies* 18:271–300.

———. 2013. Payout policy, financial flexibility, and agency costs of free cash flow. Working Paper, Tel Aviv University.

Ofer, A., and A. Thakor. 1987. A theory of stock price responses to alternative corporate cash disbursement methods: Stock repurchases and dividends. *Journal of Finance* 42:365–94.

Peyer, U., and T. Vermaelen. 2005. The many facets of privately negotiated stock repurchases. *Journal of Financial Economics* 75:361–95.

Ramakrishnan, R. T. S., and A. Thakor. 1984. Information reliability and a theory of financial intermediation. *Review of Economic Studies* 51:415–32.

Rau, P. R., and T. Vermaelen. 2002. Regulation, taxes, and share repurchases in the United Kingdom. *Journal of Business* 75:245–82.

Renneboog, L., and P. G. Szilagyi. 2011. The role of shareholder proposals in corporate governance. *Journal of Corporate Finance* 17:167–88.

Roll, R. 1988. R^2. *Journal of Finance* 43:541–66.

Skinner, D. J. 2008. The evolving relation between earnings, dividends, and stock repurchases. *Journal of Financial Economics* 87:582–609.

Song, F., and A. Thakor. 2007. Relationship banking, fragility and the asset-liability matching problem. *Review of Financial Studies* 20:2129–77.

———. 2010. Financial system architecture and the co-evolution of banks and markets. *Economic Journal* 120:1021–55.

Stephens, C. P., and M. S. Weisbach. 1998. Actual share reacquisition in open-market repurchase programs. *Journal of Finance* 53:313–33.

Stulz, R. 1988. Managerial control of voting rights: Financing policies and the market for corporate control. *Journal of Financial Economics* 20:25–54.

Thakor, A. 2012. Incentives to innovate and financial crises. *Journal of Financial Economics* 103:130–48.

Thakor, A., and T. Whited. 2011. Shareholder-manager disagreement, animal spirits, and corporate investment. *Review of Finance* 15:277-300.

Thomas, R. S., and J. F. Cotter. 2007. Shareholder proposals in the new millenium: Shareholder support, board response, and market reaction. *Journal of Corporate Finance* 13:368–91.

Van den Steen, E. 2004. Rational overoptimism (and other biases). *American Economic Review* 94:1141–51.

———. 2010a. Disagreement and the allocation of control. *Journal of Law, Economics and Organization* 26:385–426.

———. 2010b. Interpersonal authority in a theory of the firm. *American Economic Review* 100:466–90.

Vermaelen, T. 1981. Common stock repurchases and market signaling. *Journal of Financial Economics* 9:139–83.

Weisbenner, S. J. 2004 Corporate share repurchases: What role do stock options play? Working Paper, University of Illinois.