



Takeover vulnerability and the credibility of signaling: The case of open-market share repurchases

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ABSTRACT

There is debate in the literature focuses on whether open market repurchases can be taken as a signal of stock undervaluation. This research argues that takeover pressures before a repurchase announcement can be a credible signal of undervaluation. The empirical results indicate that repurchasing firms with a higher probability of takeover experience greater announcement effects, improvements in operating performance and long-run abnormal return, positive forecast revisions by financial analysts, and enhanced agreement between management and shareholders. These findings suggest that takeover probability and open-market share repurchases appear to constitute a double-signal for conveying stock undervaluation to the market.

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1. Introduction

The signaling argument for open-market repurchases encounters difficulties from an empirical standpoint. [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”.¹

The signaling hypothesis in the case of open-market repurchases has weaknesses, however. First, the market knows only the targeted amount of repurchases that a board of directors has approved. It does not know the exact timing of a repurchase or the amount repurchased at any time.² A survey by [Brav et al.](#)

(2005) finds that managers do not use open-market repurchases as a costly signal. Second, [Dittmar and Dittmar \(2008\)](#) show that aggregate repurchases increased in the bull market of 2003–2007. Thus, the evidence is contrary to the predictions of the signaling story.

Yet researchers continue to search for support for the signaling hypothesis in open-market repurchases. The key insight of my research is that investors can react to the signal when repurchasing firms face strong takeover pressures.

How can takeover pressures be a credible repurchase signal? Investors who evaluate the signal or the information content of a repurchase announcement should also consider the particular firm's takeover likelihood, since stock undervaluation can affect both takeover likelihood and a firm's repurchase decision ([Palepu, 1986](#); [Comment and Schwert, 1995](#); [Ikenberry et al., 1995](#); [Billett, 1996](#); [Chan et al., 2004](#); [Lie, 2005](#)). Therefore, open-market repurchases reveal managers' beliefs that their firms are undervalued, and strong takeover pressures prior to an announcement add to the credibility of the signal.³ Our inference is also related to the findings of [John and Mishra \(1990\)](#), [Louis and Robinson \(2005\)](#), [Louis and White \(2007\)](#), [Louis et al. \(2010\)](#), and

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¹ Nonsignaling motivations for repurchases include: distribution of excess cash ([Brennan and Thakor, 1990](#)); reduction of agency costs ([Denis and Denis, 1993](#); [Grullon and Michaely, 2004](#); [Oswald and Young, 2008](#)); movement toward an optimal financial leverage ([Dittmar, 2000](#)); expropriation of creditor interests ([Maxwell and Stephens, 2003](#)); financing of employee stock option plans ([Kahle, 2002](#)); maximization of employee stock option value ([Jolls, 1998](#)); stock price support ([Dudley and Manakyan, 2011](#)); directors' liquidity needs ([Renneboog and Trojanowski, 2011](#)); and enhancement of investor-management agreement ([Huang and Thakor, 2013](#)).

² In U.S. corporations, open-market repurchase programs are not firm commitments, so the completion rates vary substantially across companies ([Stephens and Weisbach, 1998](#); [Rau and Vermaelen, 2002](#)).

³ Note that my conjecture does not imply that potential acquirers consider a firm to be undervalued because they have better information about the firm's value than its managers do. Rather, potential acquirers can more precisely estimate the value of the target by consulting with an investment bank that can provide advisory services on the evaluation of assets and provide technical and tactical assistance throughout the takeover process ([Servaes and Zenner, 1996](#)).

Babenko et al. (2012), who suggest that managers who use a double-signal convey private information to the market.

Grullon and Michaely (2004) document three implications of the signaling hypothesis: (1) repurchase announcements should be followed by positive price changes; (2) repurchase announcements should be accompanied (although not necessarily immediately) by positive news about profitability or cash flows; and (3) repurchase announcements should immediately lead to positive changes in the market's expectation about the firm's future profitability. To test these three implications, I examine the effects of the likelihood of takeover bids on repurchasing firms. That is, the takeover probability of repurchasing firms should be positively correlated with the market reaction to repurchase announcements, to the change in their operating performance, and to long-run stock returns.

Grullon and Michaely (2004) suggest that revisions in analysts' forecasts after repurchase announcements can indicate whether the market received a signal. They, however, find that analysts revise earnings forecasts downward during the six-month period after a share repurchase announcement, a finding that is contrary to the predictions of the signaling hypothesis.

Bartov (1991) finds weak evidence that open-market repurchase announcements convey information about earnings changes; analysts revise their earnings expectations of repurchasing firms upward around a repurchase announcement. Hertzel and Jain (1991) also show that analysts revise their forecasts of earnings per share upward following repurchase tender offer announcements. Brous and Kini (1993) document that announcement-month forecasts are systematically revised upward for takeover targets. This supports the information hypothesis that a takeover announcement conveys favorable information about the target firm, whether by motivating inefficient managers to implement a higher-value operating strategy or by signaling undervaluation of the target firm's shares.

If an open-market repurchase conducted by a firm facing a high probability of takeover conveys favorable information about the firm's earnings, financial analysts should respond by revising their earnings forecasts. I thus expect repurchasing firms with a high takeover probability to experience more upward revisions in analysts' forecasts following the repurchase announcement.

According to information economics, the communication of more information means that agents are more likely to agree on a given course of action, conditional on their information sets. Huang and Thakor (2013) find that a firm is more likely to buy back shares when there is poor investor-management agreement, and that the level of agreement improves following a repurchase. They suggest that open-market repurchases are not likely to be motivated by signaling, but rather that firms use repurchases strategically to improve alignment between management and shareholders by removing investors who are more likely to disagree with management.

However, I offer two observations on Huang and Thakor's (2013) model. First, their model assumes that investors' assessment of repurchasing firms is a constant. That is, investors who agree with management (the "agreeing" investors) put the same valuation on the repurchasing firm in both pre- and post-repurchase announcement periods. In fact, agreeing investors may update their expectations of repurchasing firms. Under the signaling hypothesis, firms announce repurchases to signal undervaluation, and the agreeing investors thus should boost their assessments of firm value. As a result, the level of agreement would also improve following a repurchase. Given that the takeover likelihood prior to the repurchases adds to the credibility of the signal, one would expect the takeover probability of repurchasing firms to be positively

correlated with the agreement between management and investors following repurchase announcements.

Second, poor agreement between management and shareholders may attract more takeover interest, because the firm's stock is more likely to be undervalued in this case (Thakor and Whited, 2011). As a result, the lower level of investor-management agreement and the higher propensity to buy back shares may be attributable instead to the associated increase in takeover probability. The signaling and agreement hypotheses, that is, are not mutually exclusive.

To test the hypotheses, I first adopt two probit models to estimate the probability that a firm will be acquired, using all Compustat-CRSP firms. In the first model, I regress the target dummy (which takes the value of 1 if a firm receives a takeover bid in a given year) on industry takeover activity and on several firm characteristics identified in the literature (Hasbrouck, 1985; Palepu, 1986; Ambrose and Megginson, 1992; Bilett and Xue, 2007; Cremers et al., 2009). In the second model, following Bates et al. (2008), I further control for the anti-takeover provisions. All independent variables are measured as of the end of the previous year. Then, I merge these two takeover probabilities with the open-market share repurchase sample individually. I label the first sample the OMR-Sample and the second the Gov-Sample.

I measure the signaling effects on the repurchasing firm by the market reaction surrounding the repurchase announcement, changes in operating performance, long-run abnormal stock return, revisions in analysts' forecasts, and investor-management agreement following the repurchase announcement. I find that repurchasing firms with a high probability of takeover have higher abnormal announcement returns, greater improvement in operating performance, and more favorable long-run abnormal returns, indicating that a high probability a firm is a takeover target adds to the credibility of repurchase signaling. These findings are consistent with the empirical evidence for the signaling hypothesis (Vermaelen, 1981; Ikenberry et al., 1995; Lie, 2005).

I next examine analysts' forecasts over the two-year period following the repurchase announcement and ask whether analysts positively revise earnings forecasts for repurchasing firms with a high probability of takeover. The post-repurchase revisions in analysts' forecasts are positive for repurchasers very likely to be takeover targets, and revisions are negative for repurchasers with low takeover probability.

I also examine the agreement between management and shareholders (proxied by institutional investor holdings, except the largest institutional investor and blockholders) for subsamples of repurchasing firms with high and low takeover probabilities. There is improvement in the investor-management agreement for repurchasers facing a high probability of takeover, but no significant change in the agreement for repurchasers with a low probability of takeover.

Overall, the empirical evidence provides further support for the contention that a high takeover likelihood makes it more credible that managers signal undervaluation to the market via open-market share repurchase.

One concern in interpretation of the relation between takeover probability and open-market share repurchases is endogeneity. First, common responses to shocks, except for the shocks particular to stock undervaluation, can influence both takeover probability and a firm's decision to repurchase shares. To deal with this problem, I include both year and industry fixed effects in the main regressions to capture common time-varying and industry shocks. Second, a repurchase may affect takeover likelihood as well. To address this simultaneity problem, I take the following actions: (1) investigation of the relation between repurchases and lagged takeover probabilities to avoid confounding inferences through

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