An Empirical Study of the Differential Market Reaction to Open-Market Stock Repurchase Announcements

Zhenhu Jin, (E-mail: Zhenhu.jin@valpo.edu), Valparaiso University

Abstract

Significant positive stock price reaction to stock repurchase announcements has been well documented in the finance literature. Most studies on repurchase focus on the average positive reaction; however, 30 percent of the repurchasing firms experience negative abnormal returns at announcement. This study examines the apparent heterogeneity in the stock price reaction to stock repurchase. The results show that the market reaction to repurchase announcements is determined by firm specific factors and is based on the overall costs and benefits analysis by the market of the stock repurchase program. The results are consistent with conventional signaling models and agency theories.

1. Introduction

It has been well documented in the finance literature that the stock market reacts positively to open-market repurchase announcements. The abnormal announcement returns are in the range of 2 - 4%. However, several studies, such as Tsestekos (1993), Erwin and Miller (1998), and Liu and Ziebart (1997), also report that while the average market reaction is positive, about 30% of the repurchasing firms in each of their study samples experience negative announcement returns. So far, studies on market reaction to open market stock repurchase announcements have focused on the positive average market reaction to stock repurchase announcements rather than the apparent heterogeneity in the stock price reaction to repurchase announcements. This paper tries to determine whether there are two fundamentally different types of repurchasing firms, with repurchases being viewed by the market as a positive event for one type and a negative event for the other. The key issue is to determine whether the observed negative reaction for about 30% of the repurchasing firms reflects the market assessment that, for some firms, repurchasing stock is a value decreasing event.

Cross-sectional regressions using variables that proxy for the various determinants of the repurchase announcement returns are performed to test the relationship between market reaction and these firm specific factors. The regressions are run on the whole sample as well as the two subgroups: Group P, firms with positive market reaction, and Group N, firms with negative market reaction. The whole sample regression results indicate that market reaction to stock repurchase announcements is significantly related to several firm specific factors in the model. The results of the two subgroup regressions indicate that the Cumulative Abnormal Returns (CAR) are significantly positively related to the size of repurchase, as a percentage of the total shares outstanding, for Group P and negatively related to the size of the repurchase for Group N. The results are consistent with the notion that repurchase announcements are viewed by the market as good news for a subset of repurchasing firms and bad news for the rest.

A Chow test is also conducted to determine whether the firms in the two groups, classified by the signs of the announcement returns, are significantly different. Variables employed in the regression model are used in the test. The result of the test rejects that hypothesis that there is no difference between the two groups, suggesting that the firm specific factors of the firms with positive announcement returns are significantly different from those of the

firms with negative announcements returns. The result of the Chow test is consistent with the regression results and further supports the notion that the differential market reaction to stock repurchase announcements is due to firm specific factors. For firms with some characteristics, open-market repurchase announcements are viewed by the market as value-increasing while other firms' announcements are viewed by the market as value-decreasing.

The paper proceeds as follows. Section one presents a literature review and provides some theoretical background for the models used in this paper. Section two presents the hypotheses, data and empirical methodology. Section three presents and discusses the test results. Section four summarizes the study and provides a conclusion.

2. Literature Review and Theoretical Background

Many studies have documented the positive market reaction to stock repurchase announcements (Masulis 1980, Dann 1981, Bradley and Wakeman 1983, Tsestkos 1993, Erwin and Miller 1998, and Liu and Ziebart 1997). Information content of the repurchase announcements and signaling effects are often cited as reasons to explain the positive valuation effects. Dann, Masulis and Mayers (1991) find evidence that stock repurchases often signal future increases in earnings and a reduction of systematic risk around repurchase announcements. They also provide evidence that investors actually revise earnings estimates upwards following repurchase announcements. Bartov (1991) studies repurchases as signals for earnings and risk changes and finds that there are unexpected positive earnings in the announcement year and that there are upward revisions of earnings forecasts by analysts. He also reports that repurchase announcements are followed by decline in the repurchasing firms' common stock risk and that repurchase announcement returns are positively related to the earnings changes conveyed by these announcements. Healy and Palepu (1993) argue that managers in undervalued firms use dividend increase or stock repurchase to signal confidence to the market.

Agency cost reduction as a result of stock repurchases can also potentially explain the positive market reaction. Jensen (1986) argues that corporate dividend payments reduce the agency cost arising from managers' incentives to use free cash flow to invest in negative NPV projects. Repurchasing stocks significantly reduces the cash available to managers for potential investments in negative NPV projects. Easterbrook (1994) posits that corporate payout today increases the probability that the firm will need to seek external financing from the capital in the future. Therefore, there is a higher probability of managers being exposed to the monitoring associated with external financing. This higher probability of future monitoring reduces the extent to which managers will deviate from stockholder wealth maximization, thus reducing the cost of the agency conflict between managers and stockholders.

Both the information content/signaling and agency cost arguments identify potential benefits of stock repurchase programs. However, the actual economic impact of a stock repurchase will consist of these benefits netted against the potential costs associated with the repurchase program. These costs include the increase in expected financing costs (due to the higher probability of external financing) and any costs associated with the reduction in financial slack (Black, 1976; Bhattacharya, 1979; Myers and Majluf, 1984). Thus, for a particular firm, if the market judges the benefits of repurchase to be smaller than the costs, the announcement returns could very well be negative. At the same time, if the repurchase announcement is interpreted by the market as a signal of deterioration in investment opportunities, the announcement effect could also be negative.

It is important to note that the signaling models and the Jensen and Easterbrook agency arguments both predict that the announcement effects should be positively related to the size of the repurchase program as a percent of the total number of shares outstanding. Under these arguments, even when the total announcement effect is negative, there is still a benefit of stock repurchases that is positively related to the size of the repurchase. Only when the repurchase itself is viewed as bad news, because it conveys a deterioration in investment opportunities, do we expect to see the announcement returns negatively related to the size of repurchase program.

3. Hypotheses, Data and Methodology

3.1 Hypotheses

The question addressed by this paper is whether stock repurchase is assessed by the market to be a value-increasing event for some firms and a value-decreasing event for others. The fact that over 30 percent of repurchasing firms experience negative abnormal returns does not, in itself, establish that such a dichotomy exists. In an event study, some sample firms could exhibit negative abnormal returns *ex post* even if the average impact of the event is positive for all firms. The observed abnormal announcement returns can be negative even when the true market reaction is actually positive due to the following reasons; market anticipation of the event, errors in estimating abnormal return, and confounding events. Thus, the key issue examined in this paper is whether the negative abnormal returns observed at announcement for a subset of stock repurchasing firms reflect the market's negative assessment of the event due to firm specific factors. Specifically, the following two hypotheses are examined:

H₁: Firms in Group P and Group N are from the same population and there are no fundamental differences between the two groups.

H₂: Any negative market reaction to stock repurchase announcements is caused by anticipation, estimation errors or confounding events and is not related to firm-specific factors.

Chow test and cross-section multi-variate regression models are used to test the hypotheses. If a stock repurchase program is viewed as value-increasing for one group of firms and value-decreasing for another because of the different characteristics of the firms, the firms in the two groups should be significantly different in some important aspects. At the same time, if the CARs for Group N are negative, on average, due to anticipation or estimation errors or other confounding events, there should be little relation between the observed CARs and the variables proxying for the determinants of the market reaction to stock repurchase announcements. As such, the adjusted R-squared of the regression for Group N should be lower than that for Group P and that the announcement CAR for Group N should not be significantly related to the size of the repurchase.

3.2 The Data

The data set consists of firms that announced open-market stock repurchases during the second half of 2000. The repurchase announcements are obtained from buybackletter.com. These events are then verified by checking the Wall Street Journal Index. The firms in the sample also pass the following screens:

1. Common stock daily returns starting from 300 days before the repurchase announcement are available.
2. There are no significant confounding announcements such as earnings reports within five days of the repurchasing announcement. This measure is taken to avoid compounding market reaction to repurchase announcement with that of the earnings announcement.
3. There are no major corporate restructuring within the 300 days before the repurchase announcement that would significantly change the nature or risk level of the firm, such as a merger or acquisition.
4. The analysts' consensus estimates for the firm's current and next years' earnings are available from First Call Earnings Estimates.

175 firms pass the screens.

3.3 Estimation of repurchase announcement returns

Abnormal returns at repurchase announcement are estimated by employing an expanded market model, including an industry index. The coefficients are estimated using 300 days' return data prior to two days before the announcement. In particular, the abnormal return of firm K at time t (AR_{kt}) is defined as:

$$AR_{kt} = R_{kt} - (\alpha_k + \alpha_k R_{mt} + \alpha_{2k} R_{ind,t}), \quad (1)$$

Where R_{kt} is the observed return of firm k on day t
 R_{mt} is the return on the index of the exchange this firm is listed
 $R_{ind,t}$ is the return on an equally-weighted portfolio of firms in the same industry as firm k on day t .
 Firms are considered to be in the same industry if the first three digits of the four-digit Standard Industry Classification Code (SIC) are the same.

Following previous studies, the market reaction to firm k 's repurchase announcement is defined as the two-day cumulative abnormal return (CAR_k). It is the sum of firm k 's abnormal return from day $t-1$ to day t . Day t is the day that the repurchase announcement appeared in the *Wall Street Journal*. Thus, the two-day CAR is computed as the sum of firm K 's abnormal return on days $t-1$ and t . The basic assumption here is that the market immediately reassesses the company following the announcement of the stock repurchase program and reacts to it. Of the 175 firms in the sample, 118 firms (67.4%) have positive cumulative abnormal returns and 57 firms (32.6%) have negative abnormal returns. The average two-day CAR for the whole sample is 2.37%. The average CAR for the 118 firms that have positive returns is 5.4%. The average CAR for the 57 firms that have negative returns is -4.0%.

3.4 Proxies for the determinants of repurchase abnormal returns

Cross-sectional regressions are performed on the full sample and the two sub-groups to examine the relationship between the variables that proxy for the determinants of repurchase abnormal returns and the observed announcement reaction and the explanatory powers of these variables in the two sub-groups. The proxies used are as follows:

1. Firm Size (SIZE): The firm size is measured as the natural log of the market value of equity as of two days before the announcement. Zeghal (1983), Eddy and Seifert (1988), and Mitra and Owers (1990) argue that firm size is a good proxy for the degree of publicly available information about a firm; the larger the firm, the greater the availability of information. Thus, the value of repurchase announcements conveying information to the market may be greater for small firms than for large firms. The sign of the coefficient is expected to be negative.
2. Debt-to-Equity Ratio (Debt): The debt to equity ratio before the repurchase announcement was made. If part of the costs of a repurchase program is a reduction in financial slack, the debt level relative to equity prior to the repurchase clearly matters. The data is from the sample firms' annual reports. The sign is expected to be negative.
3. Earnings Volatility (EARNVOL): Earnings volatility is estimated as the standard deviation of earnings per share over the 16 quarters immediately preceding the repurchase announcement. If part of the benefit of a stock repurchase program is to convey managerial information to the market, then the information provided will be more valuable for firms with less predictable earnings. On the other hand, for firms with stable earnings, the value of the additional information from the repurchase announcement may not be as significant. The sign is expected to be positive.
4. Institutional holdings (INST): The fraction of outstanding shares held by institutions is used as a proxy for the intensity of monitoring that the firm is subjected to by institutions. It is hypothesized that the agency costs arising from the manager-stockholder conflict are smaller when institutions monitor the firm more closely. Thus, the benefit of agency cost reduction may be smaller for firms with large institutional holdings. An alternative interpretation of this variable is that heavy institutional holdings are associated with greater information availability about the firm, reducing the signaling benefit from repurchase announcements. Both interpretations predict a negative coefficient.
5. Insider Ownership (INSIDER): The percentage of shares owned by directors and senior officers, and someone who owns more than 5% of the shares of the company. It is used here as a proxy of the amount of monitoring activities. Higher insider ownership should result in more intensive monitoring by the board, less serious agency problems, less benefit from the reduction of agency costs, and thus a greater likelihood of repurchase program being value-decreasing. The sign is expected to be negative.
6. Percent of Repurchase (Rep): It is calculated as a percentage of the repurchase of the total shares outstand-

- ing at the time of the repurchase announcement. To the extent that the repurchase announcement is unanticipated, both the signaling and agency cost arguments predict that the abnormal return at announcement should be positively related to the relative size of the repurchase.
7. Pre-Announcement CAR (PRECAR): The CAR for each firm, from day -20 through day -2, is used to control for market anticipation of the repurchase announcement. If observed negative abnormal returns result from market anticipation, PRECAR should be positive, and negatively related to the two-day announcement CAR.
 8. Projected Earnings Growth Change (PEARN): This is a dummy variable, taking on a value of 1 if the projected earnings growth for the next fiscal year is greater than the current year, as reported by the First Call Earnings Estimates and 0 otherwise. This is a proxy for future growth and used to test whether market response to repurchase announcement is related to projected future earnings and growth prospects.

3.5 Chow Test

To test whether the variables in the two sub-groups are statistically different, a Chow test is performed. If, as expected, there is indeed a subset of firms for which stock repurchase announcements is a value-decreasing event due to their firm specific factors, then the variables proxying for these factors should be different from those of the firms for which stock repurchase is a value-increasing event. The purpose of this test procedure is to see whether the null hypothesis (that the variables in the two groups are not different) can be rejected.

4. Empirical Results

3.1 Preliminary Results

Table 1 reports the mean of the variables used in the cross-sectional regressions, for the entire sample, and separately for firms that experience a positive CAR at announcement (Group P), and those that experience a negative CAR (Group N). For the purpose of this paper, 5% significance level is deemed satisfactory. A comparison across the two groups gives a preliminary indication regarding the extent to which firms with negative CARs differ from those with positive CARs, in terms of *ex ante* characteristics. If negative CARs stem from the degrees of leverage, market anticipation, estimation errors and confounding events, we expect the two sub-samples to differ only with respect to variables that proxy for market anticipation.

While the CARs at announcement differ significantly across the two groups, this is only to be expected since the groups are formed on the basis of announcement CARs. The sub-sample values of pre-announcement CARs (PRECAR) suggest that there is little difference between the two groups. Both groups have mean value of PRECAR that are negative and not significantly different from each other. There is no evidence that the market reaction to the repurchase announcements is due to market anticipation.

However, the two groups are significantly different with respect to several other variables, such as firm size, debt-to-equity ratio, earnings volatility, institutional holdings, and projected earnings growth change. The directions of the differences are consistent with the theoretical predictions and tend to explain the difference in announcement CARs. For instance, announcement CARs tend to be negative for larger firms (with greater availability of public information), and those with less volatile earnings. In both cases, the value of future information releases is likely to be low. Group N also has significantly higher debt-to-equity ratios than Group P, suggesting that the level of leverage may be negatively related to announcement returns. Negative announcement CAR firms are also characterized by large institutional holdings. Thus, these are firms where agency costs are likely to be low to begin with because of closer institutional monitoring. Overall, negative announcement CARs tend to occur when the benefits of stock repurchase are likely to be small and the costs, such as reduction in financial slack, tend to be big. The preliminary findings are consistent with the notion that the announcement returns reflect the market's assessment of the benefits and costs associated with the repurchase program.

The above results are suggestive of factors that determine the magnitude of CARs at the announcement of a stock repurchase program, and explain the incidence of negative CARs. However, it is necessary to examine the influence of each factor while controlling for the other factors. Cross-sectional regressions are conducted for this purpose. Another motivation is to compare the explanatory powers of the two regressions for the two sub-samples. If they are roughly the same, then there are reasons to believe that the negative announcement CARs are driven by the underlying fundamental variables to the same extent as positive announcement CARs, rather than being caused by estimation errors or confounding events.

3.2 Analysis

Cross-sectional regressions are used to examine the relationship between the dependent variable, the two-day CARs, and the independent variables listed in Table 1. The results of the full sample and the two sub-sample regressions are reported in Table 2.

For the full sample, the coefficient of firm size is significant and negative, consistent with the hypothesis that the larger the firm, the more information is available about the firm and the less valuable the repurchase announcement is in providing additional information. The coefficient for debt-to-equity ratio is also significant and negative, as expected. This suggests that the degree of leverage does have an impact on how the market reacts to repurchase announcements. The higher the leverage, the more likely the announcement returns will be negative. The coefficient of earnings volatility is positive and significant. The more volatile the earnings are, the less information investors can get from earnings announcements in terms of the firm's future prospects and the more valuable the announcement of stock repurchase is. The coefficient of institutional holdings is negative and significant, consistent with both the agency cost reduction and information effect hypotheses. The size of repurchase has a positive and significant coefficient, consistent with the notion that if the repurchase announcement is good news, the more shares to be repurchased, the better. The coefficient of projected earnings growth change is positive and significant, indicating that investors take into account the future earnings prospects when reacting to the repurchase announcement. The coefficients of insider ownership and Precar are insignificant. Overall, the regression explains 41% of the cross-sectional variation in announcement CARs.

For the two sub-sample regressions, the coefficient of the size of repurchase is significant and positive for Group P as predicted by both signaling and agency cost arguments but it is significant and negative for Group N. The coefficient of firm size is negative and significant for Group P but not significant for Group N. Debt-to-equity is significant and negative for Group N, as expected. The coefficients of institutional holdings for both groups are significant and has the expected signs. The regressions explain 28% of the cross-sectional variation in announcement CARs for Group P and 34% for Group N.

The regression results from two sub-groups provide important evidence to reject the H_2 and to support the contention that the observed negative announcement CARs for Group N is indicative of the market's assessment of the costs and benefits of a stock repurchase. The different signs of the size of the repurchase show that the repurchase programs do convey very different information to the market for the two groups. For Group P, the positive sign indicates that the repurchase program, in and of itself, is viewed as value-increasing, and the value increase is positively related to the percent of shares to be repurchased. But for Group N, the repurchase, in and of itself, is viewed as value-decreasing, and the more shares to be repurchased, the greater decrease in value. There is a general consensus that the signaling effect and the agency cost reduction are the main reasons why many firms experience positive market reaction when the announcements of stock repurchase are made. The fact that the value of R-squared for Group N is greater than that of Group P in the two sub-sample regressions indicates that the dependent variables are more closely related to the independent variables in Group N than that in Group P and that the negative reactions are due to these firm specific factors and not estimation errors. This provides strong evidence to reject H_2 .

3.3 The Chow Test

The result of the Chow test rejects the null hypothesis that there is no difference between the variables in Group P and Group N at the 1% significance level. This clearly shows that there are indeed two groups of firms

with different firm specific characteristics that result in different market reaction to stock repurchase announcements.

5. Conclusion

This paper examines the differential market reaction to stock repurchase announcements. It offers evidence that stock-repurchasing firms fall into two distinct categories, with repurchase being a value-increasing event for one, and a value-decreasing event for the other due to different firm specific characteristics. The results of this study strongly suggest that market reaction to stock repurchase announcements is based on the net effects of the costs and benefits of the repurchase program, which differ from firm to firm. It shows that a seemingly positive corporate event, such as the announcement of stock repurchase, could very well be perceived by the market as having a negative impact on the value of the company for some firms due to firm specific factors.

6. Suggestions for Future Research

The findings of this paper may have implications for future studies on other corporate events, such as stock split, seasoned new issue, dividend omission, layoffs and so on. It will be interesting to study whether there also exists a heterogeneous market reactions to these events and how market reactions are affected by various firm specific factors. The answers to these questions will certainly deepen our understanding of the market implications of these important corporate events.

Table 1

The means of the variables of interest for the full sample, and for subgroups based on whether the CAR at announcement is positive (Group P), or negative CAR (Group N).

Variable	Full Sample (N=175)	Group P Car > 0 (N=118)	Group N Car < 0 (N=57)
SIZE	2,209 m*	1,577 m	3,497 m**
DEBT/EQUITY	3.166	1.930	5.400**
EARNVOL	0.220	0.260	0.130**
INST	13.480	8.160	21.760**
INSIDER	35.000	34.700	36.000
REP	0.080	0.090	0.070
PRECAR	-4.600	-4.000	-5.000
PEARN	0.650	0.740	0.470**
Car	2.370	5.400	-4.030**

* The numbers reported here are in millions. However, in the regression models, natural log of the market value is used.

**P = .05. Group P vs. Group N.

Table 2

Results of multi-variate, cross-sectional regressions.

T-statistics are reported in the parentheses. The sub-groups are formed based on CAR. Group P consists of 118 firms with positive CARs and Group N consists of 57 firms with negative CARs.

	Full	Group P	Group N
Variables	175	118	57
Intercept	0.11* (2.11)	0.13* (2.05)	0.01 (1.34)
Size	-0.02* (2.15)	-0.02* (1.96)	-0.05 (0.98)
Debt/Equity	-0.17* (2.25)	-0.02 (0.76)	-0.21* (2.86)
Earnvol	0.08* (3.24)	0.01 (0.74)	.019 (1.33)
Inst	-0.08* (2.18)	0.04* (2.07)	-0.03** (2.76)
Insider	0.01 (0.44)	0.02 (0.26)	0.01 (0.33)
Rep	1.98* (2.12)	3.53* (3.86)	-2.34** (3.28)
Precar	-0.02 (1.08)	-0.01 (0.70)	-0.04 (0.49)
Pearn	0.04* (2.23)	0.02 (0.46)	0.01 (0.86)
Adjusted R ²	0.41	0.28	0.34
F-Statistics	11.02*	4.95*	5.07*

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Notes