

# Why Do REITs Repurchase Stock? Extricating the Effect of Managerial Signaling in Open Market Share Repurchase Announcements

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## Abstract

This paper explores the effect of stock repurchase announcements on equity returns for publicly traded real estate investment trusts (REITs). In addition to providing analysis of the corporate decision to repurchase shares, the study of share repurchases in the context of REITs provides a novel opportunity to disentangle the impact of competing theories for the abnormal returns observed around repurchase announcements. Prior literature advances six hypotheses to explain the stock price reaction associated with repurchases. Given that the theories all predict the same stock price reaction, existing studies are unable to disentangle the competing hypotheses. The intent of this research is to extricate the signaling hypothesis from the competing explanations to determine whether the managerial signaling hypothesis is a credible explanation for the abnormal returns observed around share repurchase announcements. After controlling for relevant economic variables, we provide evidence for the efficacy of the managerial signaling hypothesis.

The return of operating profits to shareholders lies at the core of corporate real estate and corporate finance theory. As such, stock repurchases have been studied extensively. Masulis (1980), Dann (1981), Vermaelen (1981, 1984), Lakonishok and Vermaelen (1990), Comment and Jarrell (1991), and Ikenberry, Lakonishok and Vermaelen (1995, 2000) all document positive abnormal stock price performance around the announcement of stock repurchases for operating firms.<sup>1</sup> The existing literature posits six hypotheses to explain these abnormal returns, namely: (1) signaling (or information content) effects associated with firm undervaluation; (2) agency cost (or free cash flow) effects; (3) personal tax effects associated with differential taxation of dividends and capital gains; (4) inter-security wealth transfers stemming from leverage increases induced by repurchases; (5) corporate tax shield effects associated with debt financing of repurchases; and (6) intra-security wealth transfers between tendering and non-tendering shareholders. However, these hypothesized effects are not mutually

exclusive. Given that the theories all predict the same stock price reaction to repurchase announcements, existing studies are unable to disentangle the competing hypotheses (*e.g.*, see Nohel and Tarhan, 1998). The purpose of the current research is to extricate the signaling hypothesis from the competing explanations to determine whether the managerial signaling hypothesis is a credible explanation for the abnormal returns observed around share repurchase announcements.

As an asset class, real estate investment trusts (REITs) possess several unique institutional attributes that render the economic intuition sustaining most of the competing theories irrelevant in explaining stock price reaction to repurchase announcements. In particular, since REITs are required to distribute 95% of income to shareholders and are exempted from federal income taxation, the impact of hypotheses two through six (in the preceding paragraph) is called into question. While this study empirically allows for confounding effects from the major competing hypotheses, the expectation is that their impact will be muted in the REIT sample when compared with an operating firm sample. Hence, investigation of repurchase announcements by REITs provides a novel approach to isolating the impact of signaling effects from those of the competing hypotheses. This study is not the first to examine REITs to evaluate the efficacy of competing theories previously documented in operating companies. Jenkins (1980) uses REITs to analyze managerial incentive compensation plans. Allen and Sirmans (1987) study merger wealth effects and find positive abnormal returns for acquired firms, concluding that the wealth gains are due to improved management of the captured firm. Howe and Shilling (1988) examine the share price reaction of REITs to announcements of new security offerings and conclude that the positive market reaction is consistent with the managerial signaling hypothesis. Jaffe (1991) theoretically models REITs to examine capital structure theory in a tax-free environment and concludes that the value of REITs is invariant to leverage changes. Hardin, Liano and Huang (2005) use REITs to study the efficiency of pricing surrounding stock splits. The current paper advances the literature using a similar platform by examining share repurchase announcements by REITs to extricate the effect of managerial signaling from other hypothesized effects. The results support the validity of the managerial signaling hypothesis as a valid explanation for the abnormal returns observed around REIT share repurchase announcements. Whereas the data and methodology employed do not allow dismissal of the impact of the competing theories in other samples, the results do provide evidence of the efficacy of the managerial signaling hypothesis.

The paper is organized as follows. The next section provides a succinct literature review. The following sections contain information on the data sample, the empirical methods and the results. The final section contains concluding remarks.

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### Managerial Signaling, Competing Hypotheses and REITs

The managerial signaling hypothesis is based on asymmetric information between managers and shareholders. If management views the firm's shares as undervalued,

the announcement of a repurchase may serve to homogenize the information sets between the two groups (Aharony and Swary, 1980; Vermaelen, 1984; Ofer and Thakor; 1987; Healy and Palepu, 1988; and Constantinides and Grundy, 1989). The most frequent interpretation of the signaling hypothesis is that the announcement of a repurchase program will precipitate a positive stock price reaction. Many authors, including Dann (1981), Vermaelen (1981), Asquith and Mullins (1986), Comment and Jarrell (1991), and Stephens and Weisbach (1998), empirically document positive stock price reactions surrounding repurchase announcements and offer interpretations consistent with the managerial signaling hypothesis, as well as competing hypotheses. However, consensus on the efficacy of the signaling hypothesis is thwarted by the existence of competing hypothesis. By focusing on REITs, the confounding influences of the non-signaling hypotheses are avoided and, thus, a more focused assessment of the impact of signaling is obtained. The remainder of this section discusses the other hypotheses and assesses their relevance to REITs.<sup>2</sup>

Jensen (1986) argues that firms where management has access to significant amounts of free cash flow incur greater agency costs (hypothesis 2). Under the agency cost (or free cash flow) hypothesis, managers with discretion over unencumbered cash tend to over-invest in projects with negative net present value. Hence, in studies of operating company repurchases, the reduction in agency costs associated with the cash disbursements from stock repurchases is hypothesized to result in a positive stock price reaction (Nohel and Tarhan, 1998). However, in the case of REITs, the potential impact of the free cash flow hypothesis is mitigated for three reasons. First, REITs are required to pay out at least 95% of net income to shareholders. Thus, opportunity to accumulate and misuse free cash flow is attenuated in REITs relative to other industries. Second, REITs are only permitted to invest in the purchase, sale and maintenance of real property. Hence, management discretion over free cash flows is limited by the restrictive nature of the possible investment opportunity set. Whereas REITs may incur agency problems by paying too much when acquiring real assets (Hardin and Wolverton, 1999), the restrictive nature of the investment opportunity set limits value destroying activities such as conglomerate acquisitions. Third, REITs have an established mechanism for the distribution of free cash flows—dividends. Operating companies attempting to reduce agency costs may prefer to distribute free cash flow through repurchases rather than dividends due to the well-documented penalties associated with future dividend reductions (Bajaj and Vijn, 1990; Kaplan and Reishus, 1990; and Denis, Denis and Sarin, 1994). However, REIT dividend policies are fundamentally different from the constant dollar dividend strategies common in many other industries (Wang, Erickson and Gau, 1993; and Bradley, Capozza and Seguin, 1998). Hence, while the current study controls for possible free cash flow effects in subsequent empirical tests to provide comparability with the existing literature, intuition affords that agency costs associated with free cash flow are muted for REITs and, thus, should not be a significant explanatory variable in the tests.

Personal tax effects (hypothesis 3), more formally referred to as dividend substitution effects (Ikenberry, Lakonishok and Vermaelen, 1995), are frequently

cited as an explanatory factor in the repurchase decision due to the differential tax rates on dividends and capital gains. However, given the 95% payout requirement, the expected dividends of REITs are large. Hence, REIT shareholders either (1) constitute a pro-dividend clientele that, presumably, have the ability to hedge the tax liability associated with cash distributions or (2) are less sensitive to the differential tax treatment of dividends and capital gains (Pettit, 1977; and Allen, Bernardo and Welch, 2000).<sup>3</sup> This does not imply that REIT investors shun capital gains, only that at the margin they are less sensitive to the differential taxation issues that are associated with dividend income. Further, Gentry, Kemsley and Meyer (2000) show that current dividends do not impose incremental tax liability on REIT shareholders. As with free cash flow effects, the subsequent empirical tests control for potential personal tax effects to provide comparability with the existing literature. As discussed in the next section, the impact of differential taxation between dividends and capital gains is gauged by including the tax rate differential (*i.e.*, dividend rate minus capital gains rate) as an explanatory variable in the empirical analysis. If REIT owners are not sensitive to the differential, then the tax effect control variable should not be significant. However, if the owners of REITs truly constitute a pro-dividend clientele, then the tax effect control will be negative since the repurchase supplants future dividends.

The preceding three hypotheses (managerial signaling, free cash flow and personal tax effects) are the dominant theories advanced in the existing literature. The remaining three hypotheses receive less attention. However, in order to extricate the impact of managerial signaling, the remaining hypotheses must be eliminated as possible explanations for the stock price reaction to repurchase announcements. The inter-security wealth transfer hypothesis (hypothesis 4), developed by Masulis (1980), argues that increases in debt financing associated with repurchases may lead to wealth transfers from bondholders to stockholders. In a sample of operating firms, Masulis finds no support for inter-security wealth transfer effects during the offer period. Further, Jaffe (1991) models REITs and concludes that in a theoretical environment, the value of REITs is invariant to leverage changes. For REITs, inter-security wealth transfers are implausible for two reasons. First, REITs frequently make large cash distributions through regular dividends and frequent repurchase programs. For an inter-security wealth transfer to occur, the increase in leverage must be *unexpected*. Given the frequency of large cash distributions from REITs, rational investors will anticipate and price the frequent leverage changes (due to the cash disgorgement) appropriately. Second, a large percentage of REIT bonds are secured by specific assets. During the sample period, approximately 68% of the debt issued by REITs was collateralized.<sup>4</sup> To the extent that capital structure changes do not affect the value of the collateral underlying asset-backed debt, debt holders are insulated from the capital structure changes associated with a repurchase. Thus, inter-security wealth transfers should not be significant for REITs.

The last two hypotheses, corporate tax shield effects (hypothesis 5) and wealth transfers between tendering and non-tendering shareholders (hypothesis 6), can

also be dismissed when considered in the context of REITs. Since REITs are not subject to corporate income tax, the corporate tax shield associated with debt financing of repurchases is obviously not pertinent. Finally, REITs usually choose open market rather than tender offer repurchases.<sup>5</sup> Since few REITs initiate tender offer repurchase programs (only open market transaction is analyzed here), wealth transfers between tendering and non-tendering shareholders are not an issue.

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## Data Description, Variable Construction and Empirical Methods

### Sample Selection

The sample of 240 open market repurchase announcements is taken from Security Data Company's (SDC) Merger and Acquisition database for the years 1982 through 1999. The criteria for inclusion are: (1) that the transaction is classified as an open market share repurchase by SDC, and (2) that the firm is a REIT (SIC Code 6798). Data elements collected from the SDC files include the announcement date, stock price four weeks before the announcement, annual operating income of the firm for the year immediately preceding the announcement, stock price one day before the announcement, book value of equity immediately prior to the announcement, transaction value of the repurchase announcement, total firm assets immediately preceding the announcement and net income for the year immediately preceding the announcement.<sup>6</sup> The SDC financial variables are used to supplement the Compustat data, when Compustat data are missing.

Next, the Standard and Poors' Compustat database provided data on firm assets (data item #6), operating income before depreciation (data item #13), total income taxes (data item #16), preferred dividends (data item #19), common dividends (data item #21), market price (data item #24), common shares outstanding (data item #25), deferred taxes (data item #35) and common equity (data item #60) immediately preceding the announcement.

Finally, the firm had to be listed on the University of Chicago's Center for Research in Security Prices (CRSP) database beginning six months before the event period. The CRSP returns data are needed to calculate stock price performance prior to the announcement and to conduct the event study. In all, 46 announcements are excluded from the sample due to nonmatching or missing data on CRSP, Compustat, or SDC, resulting in a final sample size of 194 announcements.<sup>7</sup> Additionally, the Wilshire REIT Index historical monthly returns were obtained from Wilshire Associates and historical federal tax rate data on personal tax rates and capital gains rates were obtained from Citizens for Tax Justice.<sup>8</sup>

Exhibit 1 reports the frequency of announcements and is formatted similar to Allen and Sirmans' (1987) Table 1. Panel A reports that over 50% of the announcements

**Exhibit 1** | Frequency of REIT Open Market Share Repurchase Announcements

Announcement	Number of Announcements	Percentage	Cumulative Announcements	Cumulative Percentage
<b>Panel A: Yearly Frequency</b>				
1982	1	0.52	1	0.52
1983	0	0.00	1	0.52
1984	1	0.52	2	1.03
1985	1	0.52	3	1.55
1987	8	4.12	11	5.67
1988	1	0.52	12	6.19
1989	7	3.61	19	9.79
1990	13	6.70	32	16.49
1991	6	3.09	38	19.59
1992	10	5.15	48	24.74
1993	9	4.64	57	29.38
1994	6	3.09	63	32.47
1995	11	5.67	74	38.14
1996	7	3.61	81	41.75
1997	10	5.15	91	46.91
1998	42	21.65	133	68.56
1999	61	31.44	194	100
<b>Panel B: Monthly Frequency</b>				
January	6	3.09	6	3.09
February	12	6.19	18	9.28
March	21	10.82	39	20.10
April	5	2.58	44	22.68
May	8	4.12	52	26.80
June	11	5.67	63	32.47
July	14	7.22	77	39.69
August	12	6.19	89	45.88
September	29	14.95	118	60.82
October	24	12.37	142	73.20
November	21	10.82	163	84.02
December	31	15.98	194	100

**Exhibit 1** | (continued)

Frequency of REIT Open Market Share Repurchase Announcements

Announcement	Number of Announcements	Percentage	Cumulative Announcements	Cumulative Percentage
<b>Panel C: Daily Frequency</b>				
Monday	42	21.65	42	21.65
Tuesday	43	22.16	85	43.81
Wednesday	41	21.13	126	64.95
Thursday	38	19.59	164	84.54
Friday	29	14.95	193	99.48
Saturday	1	0.52	194	100

*Notes:* The sample is drawn from the SDC's Merger and Acquisition database and includes all REIT open market share repurchase announcements with available CRSP data. SDC contains 240 REIT open market repurchase announcements. Forty-six of these announcements are lost due to missing data.

occur in 1998 and 1999 and Panel B reports monthly frequency.<sup>9</sup> To demonstrate that the analysis is not contaminated by the day-of-the-week effect, Panel C reports that the announcement distribution across days of the week is fairly constant, with the most occurring on Tuesday (43) and the least on Friday (29).

Construction of Signaling Variables

Three variables were constructed to test the impact of managerial signaling. The first two signaling variables measure pre-announcement stock price performance. Stephens and Weisbach (1998) posit that managers will initiate repurchase programs to signal undervaluation “following a decline in their share price, when their stock is more likely to be undervalued.” Several studies, including Dann (1981), Vermaelen (1981), Comment and Jarrell (1991) and Ikenberry, Lakonishok and Vermaelen (1995, 2000), offer a similar interpretation of the signaling hypothesis for repurchases following periods of poor stock price performance. Two variables measure the pre-announcement stock performance of the announcing firm. First, the abnormal six-month holding period return ending 10 days before the announcement defined as the cumulative daily stock return for each firm minus the cumulative return on the CRSP equally weighted index is used as a measure of past stock price performance.<sup>10</sup> Second, the simple return in the stock price over the preceding four weeks is used to capture short-term price effects. While potentially subject to the influence of competing hypotheses,

Comment and Jarrell (1991) and Stephens and Weisbach (1998) find that operating firms performing poorly prior to the announcement have the largest positive announcement effect and interpret this as evidence of managerial signaling.

The third signaling variable, the market-to-book equity ratio, also serves as a proxy for undervaluation of the firm. Ikenberry, Lakonishok and Vermaelen (2000) posit that firms with relatively low market-to-book values have greater potential for undervaluation than firms with relatively high market-to-book values. The measure is constructed here by using the product of Compustat's most recent closing price (data item #24) and common shares outstanding (data item #25) divided by total common equity (data item #60). If Compustat has missing data, it was supplemented when possible with the SDC variables, price per share and book value per share prior to the announcement.

### Construction of Control Variables

The most important control variables are for the competing hypotheses. In the existing literature, agency effects and personal tax effects are the most frequently offered and best-supported alternatives to the managerial signaling hypothesis. Whereas the unique institutional attributes of REITs mitigate the logic behind the major competing hypotheses, this intuition on the irrelevance of the agency hypothesis is not shared by all authors. With respect to REITs and agency/free cash flow effects, Bradley, Capozza and Seguin (1998) argue that there is discretion in free cash flows despite the 95% payout rule due to depreciation treatment. Additionally, Capozza and Seguin (1998) argue that agency costs are pertinent in REITs due to management overspending on salaries and/or the size of the management team. To allow for these divergent views, a control variable to measure the degree of free cash flow left to managerial discretion is included. Further, because the tax effect hypothesis is the other major competing hypothesis in the existing literature, a personal tax control variable is also included.

To control for personal tax effects, the spread between the maximum personal tax rate on ordinary income and the capital gains rate at the time of the announcement (hereafter referred to as the tax spread) is included. During the sample period (1982–1999), the maximum ordinary income tax rate changed five times. The maximum capital gains tax rate also changed five times, although the changes were not synchronized.<sup>11</sup> Assuming that REIT owners are insensitive to the form of cash disbursements (Pettit, 1977), the stock price reaction should not be sensitive to personal tax effects for REIT repurchases. However, if REIT shareholders constitute a true pro-dividend clientele, then the coefficient on the tax spread variable will be negative.

To control for potential agency effects associated with free cash flow (FCF), the empirical tests include the free cash flow metric proposed by Lehn and Poulsen (1989), specifically:



$$\begin{aligned}
 \text{FCF} &= \text{Operating income before depreciation} \\
 &\quad - (\text{total income taxes} - \text{change in deferred taxes}) \\
 &\quad - \text{gross interest expense on debt} - \text{preferred dividends} \\
 &\quad - \text{common dividends.} \tag{1}
 \end{aligned}$$

The Lehn and Poulsen (1989) FCF measure is designed to capture the cash subject to management discretion. Again, free cash flow effects should be muted in REITs due to the large payouts, the restricted investment opportunity set and the established cash disbursement mechanism. Hence, the FCF control should not be significant in the tests.

In order to isolate potential signaling effects, controls are provided for five additional factors. First, movements in the REIT market are controlled for by using the monthly return of the Wilshire REIT Index for the announcement month, as well as one and two month lagged returns of the index. Given that the signaling premise is based on undervaluation of the individual REIT, controlling for movements in the REIT market is important. Second, the total assets of the firm is included to control for size effects. For example, size effects may include well-documented small firm effects (*e.g.*, Banz, 1981; Fama and French, 1992; and Barber and Lyon, 1997) or transparency factors (Ang and Brau, 2002). Larger firms, which are generally more transparent and therefore less subject to informational asymmetries, may react differently to repurchase announcements. Third, as noted by Ikenberry, Lakonishok and Vermaelen (1995), the size of the repurchase program may impact the market response. The size of the repurchase announcement is controlled for here by including the ratio of the announced repurchase size in dollars to the market capitalization of the firm. Fourth, differences in dividend policy are controlled by including the dividend payment for the preceding year. Given that REITs must pay out 95% of net income in the form of dividends in order to maintain their tax exempt status, and given the additional transactions cost of repurchases, substitution of repurchases for dividends is unlikely. However, for completeness, dividend control is included in the model. Finally, as shown in Exhibit 1, the frequency of the repurchase announcements varies considerably over time and is clustered in 1998 and 1999. To control for the clustering of repurchases, a ratio is included that equals the number of announcements in a given year divided by the total number of announcements over the sample period.<sup>12</sup>

Exhibit 2 reports the summary statistics for each explanatory variable. Panel A reports the three signaling variables. Both the long-term (−16%) and short-term (−4%) pre-announcement stock returns indicate significant average underperformance by the sample firms preceding the repurchase announcement.

**Exhibit 2** | Summary Statistics of Explanatory Variables for a Sample of REIT Open Market Share Repurchase Announcements from 1982 to 1999

Explanatory Variable	Sample Size	Mean	Std. Dev.	t-Statistic	p-value
<b>Panel A: Signaling Variables</b>					
Six-month abnormal stock return	194	-0.16	0.18	-1.30	<0.0001
Four-week stock return	194	-0.04	0.23	-2.26	0.0248
Market-to-book equity	173	1.90	1.83	13.69	<0.0001
<b>Panel B: Competing Hypotheses Control Variables</b>					
Tax spread	194	0.15	0.08	27.45	<0.0001
Free cash flow (\$ million)	143	48.72	109.48	5.32	<0.0001
<b>Panel C: Other Relevant Control Variables</b>					
Total assets (\$ million)	183	691.84	1431.90	6.54	<0.0001
Transaction value (\$ million)	182	37.95	66.00	7.76	<0.0001
Wilshire REIT Index monthly return (%)	194	0.16	4.67	0.48	0.6306
Wilshire REIT Index 1-month lag (%)	194	-1.29	4.57	-3.93	0.0001
Wilshire REIT Index 2-month lag (%)	194	-1.09	4.00	-3.81	0.0002
Dividend payment in prior year (\$ million)	194	19.01	26.53	9.98	<0.0001
Repurchase frequency ratio	194	0.16	0.12	19.49	<0.0001

*Notes:* The sample is drawn from the SDC's Merger and Acquisition database and includes REIT open market share repurchase announcements with available CRSP data from 1982 to 1999. The six-month abnormal stock return is calculated for the six months beginning two weeks before the announcement using CRSP data by subtracting the compounded CRSP equally weighted market index from the compounded firm stock return over the same period. The four-week stock return is calculated using SDC data and is the percentage price change in the security over the four weeks preceding the announcement. The market-to-book equity is the ratio of the market equity value of the firm divided by the book value of firm equity immediately preceding the announcement (from Compustat and supplemented with SDC when missing). The tax spread is calculated as the difference between the maximum individual tax bracket and the capital gains tax rate. Free cash flow is calculated using the Lehn and Poulsen (1989) free cash flow metric. Total assets immediately preceding the announcement are retrieved from Compustat and supplemented with SDC data when missing. The transaction value is from SDC and relies on the publicly announced value of the repurchase program at the time of the announcement. The Wilshire REIT index data is obtained from Wilshire Associates. The dividend payment in the prior year is obtained from Compustat. Finally, the repurchase frequency ratio equals the number of announcements in a given year divided by the total number of announcements over the sample period (*i.e.*, all 194 announcements). The *t*-Statistic and *p*-value are for the null hypothesis that the mean of the variable in question equals zero.

The average market-to-book ratio for the announcing firms is 1.90. Panel B reports the control variables for the primary competing hypotheses, the tax spread and the free cash flow variables. The average tax spread advantage for capital gains is 15% over the sample period and the average firm has approximately 49 million dollars in free cash flow. Finally, Panel C reports the other control variables used in the regression model. The average firm holds \$692 million in assets and announces an average repurchase of nearly \$38 million. The Wilshire REIT Index indicates that in the contemporaneous month, REIT stock performance is not significantly different from zero, but in each of the two months preceding the repurchase, REITs on average experience significant and negative returns. Hence, REIT managers may use repurchases to signal that their firm stands out from the industry and is undervalued relative to other REITs.

### Empirical Methods

Abnormal returns surrounding the repurchase announcements are estimated using standard market model event-study methodology (Brown and Warner (1980, 1985)). A 21-day event window surrounding the announcement ( $\text{day}_{-10}$  to  $\text{day}_{+10}$ ) is employed and beta is estimated by using the daily returns of the stock for the six months prior to the beginning of the window. In the regression models, the dependent variable is the three-day cumulative abnormal return (CAR) calculated using the day before the announcement, the announcement date, and the day following the announcement. We chose a three-day window to allow for any leakage preceding the announcement and for those announcements that take place after the market closes.<sup>13</sup>

The model employed to explain the abnormal returns associated with a share repurchase announcement is:

$$\text{CAR}_{(-1,0,+1)_i} = \alpha_i + \phi X_i + \gamma Y_i + \theta Z_i + \varepsilon_i, \quad (2)$$

where:

- $i$  = The  $i^{\text{th}}$  announcement;
- $\alpha$  = The intercept of the model;
- $\phi$ ,  $\gamma$  and  $\theta$  = Vectors of coefficients;
- $X$  = Vector of the three signaling variables;
- $Y$  = Vector of the two primary competing hypotheses variables;
- $Z$  = Vector of the other control variables; and
- $\varepsilon$  = A random error term.

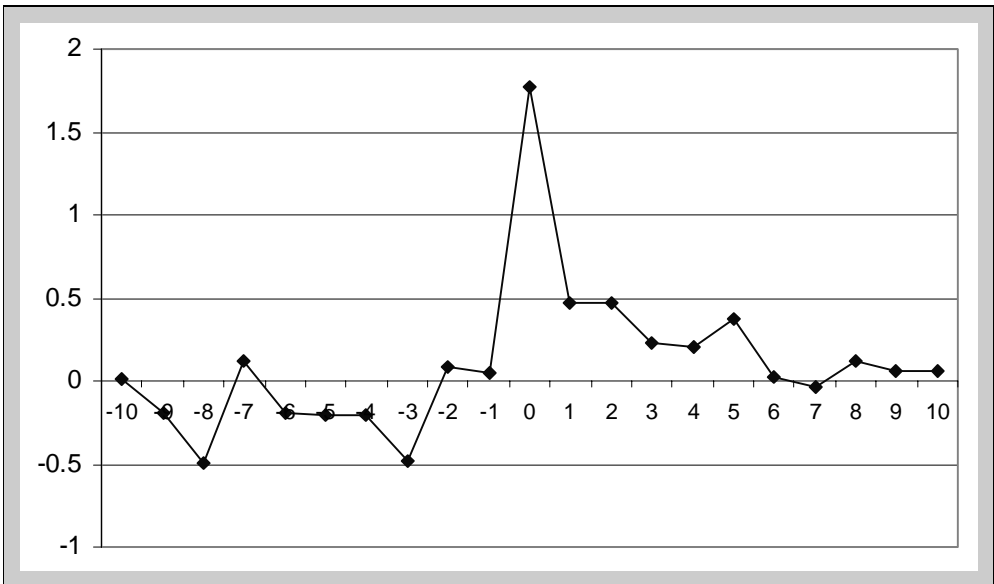
## Results

### Describing the Announcement Reaction: Measuring Direction and Magnitude

Exhibit 3 graphs the daily abnormal returns. Consistent with existing studies of operating companies, the announcement of a repurchase produces a significant and positive abnormal return in our sample. The abnormal return on day +1 is also positive, likely the result of announcements made after the close of the market. The abnormal return on day -1 is negligible.

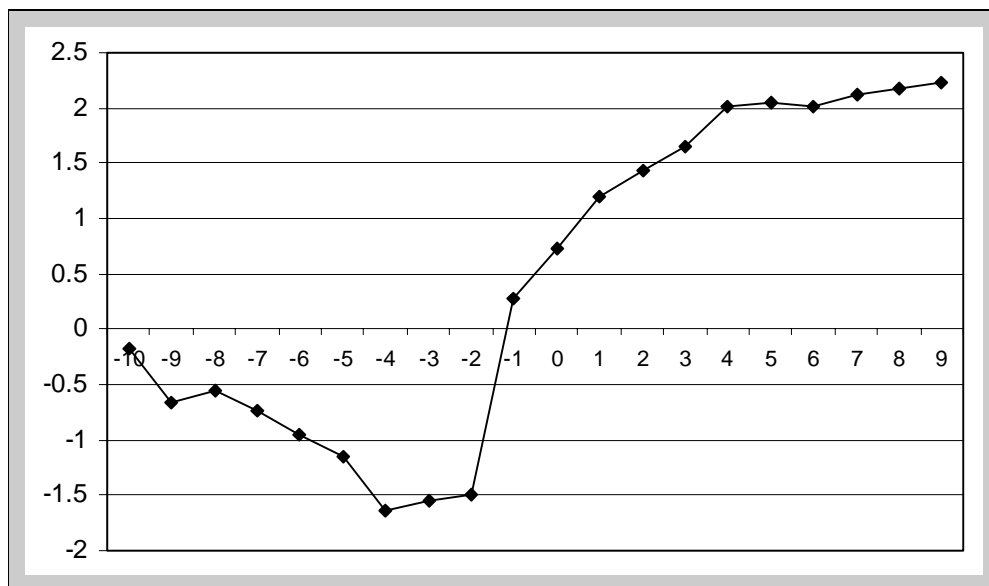
Exhibit 4 graphs the CARs. The negative returns prior to the announcement of the repurchase followed by the positive stock price reaction on the event date are consistent with the undervaluation signals offered by Comment and Jarrell (1991) and Stephens and Weisbach (1998). Specifically, the poor stock price performance prior to the announcement may lead management to signal that the stock is

**Exhibit 3** | Abnormal Returns for REITs Announcing Open Market Share Repurchases from 1982 to 1999



*Notes:* The sample is drawn from the SDC's Merger and Acquisition database and includes all REIT open market share repurchase announcements with available CRSP data from 1982 to 1999. The sample consists of 194 announcements. Abnormal returns are calculated using standard market model event-study methodology. A 21-day event window surrounding the announcement is used and beta is estimated using daily stock returns for the six months prior to the beginning of the window. Day 0 is the announcement day as reported by SDC. The vertical axis is the abnormal return in percent and the horizontal axis is the day relative to the announcement day.

**Exhibit 4** | Cumulative Abnormal Returns for REITs Announcing Open Market Share Repurchases from 1982 to 1999



Notes: The sample is drawn from the SDC's Merger and Acquisition database. The sample consists of 194 announcements. Abnormal returns are calculated using standard market model event-study methodology. A 21-day event window surrounding the announcement is used and beta is estimated using daily stock returns for the six months prior to the beginning of the window. Day 0 is the announcement day as reported by SDC. The vertical axis is the cumulative abnormal return in percent and the horizontal axis is the day relative to the announcement day.

undervalued. The overall trend for the 21-day window (day -10 to day +10) is positive.

Details of the 21-day event window are provided in Exhibits 5 and 6. Of particular interest, Exhibit 5 reports that the daily abnormal returns are positive and significantly different from zero on days 0, +1 and +2. Exhibit 6 provides additional detail on the cumulative abnormal returns. The significantly negative CAR from day -10 to day -2 (-1.5%) is statistical evidence of underperformance in the period immediately prior to the repurchase announcement. The average three-day CAR used in subsequent empirical tests equals 2.3% and is significant beyond the .01 level. The 21-day CAR for the event window is significant and positive (2.07%).<sup>14</sup>

The impact of repurchase announcements in the sample is similar in magnitude to prior studies. In a study not limited to REITs, Ikenberry, Lakonishok and Vermaelen (1995) report a five-day CAR (day -2 to day +2) of 3.54%.

**Exhibit 5** | Event Study Abnormal Returns where Day 0 is the Announcement of an Open Market Share Repurchase by a REIT from 1982 to 1999

Day	Sample Size	Abnormal Return	Std. Dev.	t-Stat.	p-value	Min.	Max.
-10	194	0.0082	3.47	0.03	0.9738	-13.95	32.58
-9	194	-0.1868	3.22	-0.81	0.4200	-25.73	23.37
-8	194	-0.4905	2.25	-3.03	0.0028	-10.77	6.27
-7	194	0.1229	2.48	0.69	0.4907	-7.04	15.10
-6	194	-0.1977	3.07	-0.90	0.3714	-23.23	12.25
-5	194	-0.2002	2.10	-1.33	0.1851	-12.67	7.20
-4	194	-0.2026	3.17	-0.89	0.3747	-10.57	26.80
-3	194	-0.4859	3.57	-1.90	0.0592	-27.84	12.25
-2	194	0.0834	3.07	0.38	0.7055	-9.89	31.96
-1	194	0.0518	2.77	0.26	0.7950	-16.98	10.54
0	194	1.7670	6.38	3.86	0.0002	-17.75	66.71
1	194	0.4658	3.62	1.79	0.0745	-28.29	11.90
2	193	0.4723	3.10	2.12	0.0356	-8.70	26.89
3	193	0.2320	2.93	1.10	0.2721	-15.36	18.54
4	193	0.2102	2.30	1.27	0.2063	-7.96	11.08
5	193	0.3705	2.20	2.34	0.0203	-10.33	7.42
6	193	0.0289	2.01	0.20	0.8421	-6.93	11.15
7	192	-0.0414	2.20	-0.26	0.7945	-7.60	11.28
8	192	0.1163	2.16	0.75	0.4569	-7.17	10.98
9	191	0.0549	2.33	0.33	0.7451	-13.58	13.41
10	189	0.0559	2.28	0.34	0.7361	-14.14	11.33

*Notes:* The sample is drawn from the SDC' Merger and Acquisition database and includes all REIT open market share repurchase announcements with available CRSP data from 1982 to 1999. Abnormal returns are calculated using standard market model event-study methodology. A 21-day event window surrounding the announcement is used and beta is estimated using daily stock returns for the six months prior to the beginning of the window. The t-stat and p-value are for the null hypothesis that the abnormal return or CAR for the respective day(s) equals zero.

Additionally, in a more recent study, Ikenberry, Lakonishok and Vermaelen (2000) report an average abnormal return for the announcement month of 0.93% ( $t$ -Stat = 2.36) for a sample of 1,060 Toronto Stock Exchange listed firms from 1989 to 1997. Other studies such as Vermaelen (1981) and Comment and Jarrell (1991) report similar results.

**Exhibit 6** | Event Study Cumulative Abnormal Returns from 1982 to 1999

Period	Sample Size	Abnormal Return	Std. Dev.	t-Stat	p-value	Min.	Max.
CAR <sub>0,+1</sub>	194	2.2328	5.86	5.31	<0.0001	-22.36	38.42
CAR <sub>-1,0</sub>	194	1.8188	6.32	4.01	<0.0001	-11.10	66.04
CAR <sub>-1,0,+1</sub>	194	2.2845	5.53	5.75	<0.0001	-13.53	37.75
CAR <sub>-10,-2</sub>	194	-1.5491	7.44	-2.90	0.0042	-38.16	37.26
CAR <sub>2,10</sub>	189	1.4414	6.10	3.25	0.0014	-25.62	26.61
CAR <sub>-10,10</sub>	189	2.0658	11.44	2.48	0.0140	-41.43	59.66

*Notes:* The sample is drawn from the Security Data Company's Merger and Acquisition database (SDC) and includes all real estate investment trust (REIT) open market share repurchase announcements with available CRSP data from 1982 to 1999. Abnormal returns are calculated using standard market model event-study methodology. A 21-day event window surrounding the announcement is used and beta is estimated using daily stock returns for the six months prior to the beginning of the window. The CARs are cumulative abnormal returns over the specified period. The t-stat and p-value are for the null hypothesis that the abnormal return or CAR for the respective day(s) equals zero.

The uniqueness of REITs makes the analysis of repurchase announcement stock price effects interesting. However, the true value of investigating repurchases in the context of REITs is the opportunity to focus on the determinants of the reaction rather than just magnitude or direction.

*Determinants of Announcement Reaction: Disentangling the Competing Hypotheses*

Exhibit 7 provides the Pearson correlation coefficients for the CARs with the three signaling variables, as well as the control variables for personal tax and free cash flow effects. Consistent with the signaling hypothesis, the six month and four week stock price performance variables are expected to be negatively associated with the CARs. The market-to-book ratio is expected to be negatively correlated with the CARs since lower market-to-books imply greater potential for undervaluation. Additionally, if the personal tax effect and free cash flow hypotheses are not applicable in a REIT sample, then the correlations of the competing hypothesis control variables with the CARs should not be significantly different from zero. If the competing hypotheses are important, then the tax spread and the free cash flow controls should be significantly correlated with the CARs. The simple correlations confirm the expectations. All three signaling variables carry the hypothesized negative sign and are significant at standard confidence

**Exhibit 7** | Pearson Correlations of Signaling and Competing Hypotheses Variables with 3-Day CAR Around the Announcement of an Open Market Share Repurchase by a REIT from 1982 to 1999

Explanatory Variable	Pearson Correlation	Coefficient <i>p</i> -value for $H_0: r = 0$	Sample Size
Six-month stock return	-0.186**	0.0096	194
Four-week stock return	-0.147*	0.0406	194
Market-to-book equity	-0.269**	0.0003	173
Tax spread	-0.067	0.3569	194
Free cash flow	-0.091	0.2805	143

*Notes:* The sample is drawn from the SDC Merger and Acquisition database (SDC) and includes all REIT open market share repurchase announcements with available CRSP data from 1982 to 1999. The six-month abnormal stock return is calculated for the six months beginning two weeks before the announcement using CRSP data by subtracting the compounded CRSP equally weighted market index from the compounded firm stock return over the same period. The four-week stock return is calculated using SDC data and is the percentage price change in the security over the four weeks preceding the announcement. The market-to-book equity is the ratio of the market equity value of the firm divided by the book value of firm equity immediately preceding the announcement (from Compustat and supplemented with SDC when missing). The tax spread is calculated as the difference between the maximum individual tax bracket and the capital gains tax rate. Free cash flow is calculated using the Lehn and Poulsen (1989) free cash flow metric. The coefficient *p*-value is for the null hypothesis that the variable in question is not correlated with the three-day cumulative abnormal return, consisting of day -1, day 0, and day +1.

\*Significant at the .05 level.  
\*\*Significant at the .01 level.

levels. Additionally, the controls for personal tax effects (tax spread) and free cash flow are not significantly different from zero.

The multivariate results are presented in Exhibit 8. The results of six regression models are reported to explain the variation in the CARs.<sup>15</sup> Models One through Three contain the five general control variables plus one of the three signaling variables. In Models 1 and 2, the six-month stock return variable and the four-week stock return variable are both significant and negative. Without controlling for the impact of the competing hypotheses, the signaling variables individually possess significant explanatory power as determinants of the CARs. The negative sign confirms the signaling hypothesis as a motivation for repurchases. In Model 3, the market-to-book ratio is not significantly different from zero; moreover, the model is not significant.

Model 4 contains all of the general control variables plus the tax spread control variable. Model 5 contains all of the general control variables plus the free cash



**Exhibit 8** | Ordinary Least Squares with the Dependant Variable Equaling the 3-day CAR Surrounding the Announcement of an Open Market Share Repurchase by a REIT from 1982 to 1999

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	4.14* (1.8)	4.92** (2.2)	5.59*** (2.3)	5.94** (2.5)	5.22* (1.8)	5.23* (1.8)
<b>Panel A: Signaling Variables</b>						
Six-month stock return	-10.08*** (-3.9)					-5.68* (-1.7)
Four-week stock return		-14.33*** (-3.8)				-12.71*** (-3.1)
Market-to-book equity			-0.26 (-1.1)			-0.05 (-0.2)
<b>Panel B: Competing Hypotheses Control Variables</b>						
Tax spread				-15.17* (-1.7)		-6.18 (-0.5)
Free cash flow					0.00 (-0.2)	0.00 (-0.1)
<b>Panel C: Other Relevant Control Variables</b>						
Natural logarithm of total assets	-0.3 (-0.8)	-0.35 (-0.9)	-0.24 (-0.6)	-0.19 (-0.5)	-0.19 (-0.4)	-0.41 (-0.8)
Transaction value/market value	1.67 (0.9)	1.47 (0.8)	0.91 (0.5)	1.50 (-0.8)	1.02 (0.5)	1.58 (0.8)
Wilshire REIT Index monthly return	0.11 (1.1)	0.12 (1.1)	0.10 (0.9)	0.16 (1.4)	0.14 (1.1)	0.19 (1.6)
Wilshire REIT Index 1-month lag	0.02 (-0.2)	0.20 (1.5)	0.10 (0.8)	0.09 (0.7)	0.14 (1.1)	0.12 (0.9)
Wilshire REIT Index 2-month lag	-0.35*** (-2.8)	-0.19 (-1.5)	-0.25* (-1.9)	-0.25* (-1.9)	-0.27* (-2.0)	-0.17 (-1.2)
Dividend/Cash ratio	0 (-0.8)	0 (-0.8)	0 (-0.8)	0 (-0.9)	0 (-0.9)	0.00 (-0.7)
Repurchase frequency ratio	-9.96* (-2.2)	-2.62 (-0.6)	-6.00 (-1.3)	-0.02 (-0.0)	-7.5 (-1.5)	-4.31 (-0.6)
F-Stat	3.26***	3.18***	1.42	1.68	1.49	2.54***
Adj. R <sup>2</sup>	0.11	0.10	0.02	0.03	0.03	0.12

**Exhibit 8** | (continued)

Ordinary Least Squares with the Dependant Variable Equaling the 3-day CAR Surrounding the Announcement of an Open Market Share Repurchase by a REIT from 1982 to 1999

*Notes:* The sample is drawn from the SDC's Merger and Acquisition database and includes all REIT open market share repurchases with available CRSP data from 1982 to 1999. The six-month abnormal stock return is calculated for the six months beginning two weeks before the announcement using CRSP data by subtracting the compounded CRSP equally weighted market index from the compounded firm stock return over the same period. The four-week stock return is calculated using SDC data and is the percentage price change in the security over the four weeks preceding the announcement. The market-to-book equity is the ratio of the market equity value of the firm divided by the book value of firm equity immediately preceding the announcement (from Compustat and supplemented with SDC when missing). The tax spread is calculated as the difference between the maximum individual tax bracket and the capital gains tax rate. Free cash flow is calculated using the Lehn and Poulsen (1989) free cash flow metric. Total assets immediately preceding the announcement are retrieved from Compustat and supplemented with SDC data when missing. The transaction value is from SDC and relies on the publicly announced value of the repurchase program at the time of the announcement. The Wilshire REIT index data is obtained from Wilshire Associates. The dividend-to-cash ratio for the prior year is obtained from Compustat and is standardized by the amount of cash held by the firm prior to the announcement. Finally, the repurchase frequency ratio equals the number of announcements in a given year divided by the total number of announcements over the sample period (*i.e.*, all 194 announcements). Estimated coefficients are reported first, *t*-Statistics are below in parentheses.

\* Significant at the .05 level.

\*\* Significant at the .01 level.

\*\*\* Significant at the .10 level.

flow control variable. Models 4 and 5 are estimated to statistically test the significance of the two primary competing hypotheses. For the tax spread variable, an insignificant coefficient is expected if REIT investors are truly indifferent between dividends and capital gains. However, if REIT investors constitute a pro-dividend clientele, then the coefficient on the tax spread control should be negative and significant. In Model 4, the tax spread variable is negative and significant at the 10% level ( $t$ -Stat = 1.7). Taken independently, this is evidence that the REIT sample is not completely immune from the tax effect hypothesis. However, the  $R^2$  for the tax spread model is much lower than the  $R^2$  for the significant signaling hypothesis variables (.03 vs. .10 and .11) and the equation is not significant ( $F$ -Stat = 1.68) at conventional significance levels, thus casting doubt on the interpretation of the variable. While there is some evidence that the tax spread variable has some explanatory power in a model without the competing hypotheses variables, the inclusion of the tax spread control variable in Model 6 (the full model) should allow the signaling hypothesis to be disentangled from other effects.

If the free cash flow hypothesis is not valid for REITs, then the coefficient on the free cash flow control variable should not be significantly different from zero.

Indeed, Exhibit 8 (Model 5) shows that the free cash flow control variable does not possess significant explanatory power. However, the model is again insignificant, which confounds interpretation of the individual variables.

Despite the marginal influence of the tax spread variable, taken as a whole, the Pearson correlations in Exhibit 7 and Models 1–5 in Exhibit 8 provide confirmation that REITs provide a signaling test that is relatively free from the confounding effects of competing hypotheses.

Model 6 reports the results for the full set of variables including the five general control variables, the three signaling variables, and the two control variables for the competing hypotheses. The first two signaling variables continue to be significant, although the six-month stock return is significant at a lower confidence level than in Model 1 (10% vs. 1%). As in Model 3, the market-to-book ratio has the predicted sign but remains insignificant. The tax spread control variable and the free cash flow control variable are insignificant in the full model indicating that the competing hypotheses have little relevance in the REIT sample. Additionally, the fact that the tax spread variable is not significant in the full model implies that its significance in Model 4 may be due to an omitted variable bias.

As a whole, the univariate analysis reported in Exhibit 7 and the multivariate regression analysis presented in Exhibit 8 provide strong evidence of the efficacy of the managerial signaling argument. By eliminating and/or controlling for the influence of the competing hypotheses, the REIT sample analysis provides a more focused assessment of the determinants of stock price reaction to a repurchase announcement. The impact of the signaling variables is significant and consistent with the managerial signaling hypothesis. Whereas the tests reported here cannot be used to discredit the efficacy of the competing hypotheses in non-REIT samples, the results do provide compelling evidence of the validity of the managerial signaling hypothesis as an explanation for the repurchase announcement stock price reaction.

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## Conclusion

The return of operating profits to shareholders and the accompanying corporate finance questions have been studied extensively for over 25 years. In the case of stock repurchases, previous studies have posited six competing theories to explain announcement reactions, including: (1) signaling (or information content) effects; (2) agency cost (or free cash flow) effects; (3) personal tax effects associated with differential taxation of dividends and capital gains; (4) inter-security wealth transfers stemming from leverage increases induced by repurchases; (5) corporate tax shield effects associated with debt financing of repurchases; and (6) intra-security wealth transfers between tendering and non-tendering shareholders. Attempts to disentangle the impact of the competing hypotheses have been thwarted because all six theories predict a positive announcement response.

This paper assesses the stock price reaction of REIT shares to an open market repurchase announcement. Examining repurchase announcements in the context of REITs provides a focused assessment of the validity of the managerial signaling hypothesis. Two variables are constructed: the six-month stock return and the four-week stock return, to capture managerial signaling effects. Additionally, low market-to-book firms have greater potential for undervaluation and, thus, include market-to-book as a third signaling variable. To ensure that the empirical tests allow for the two major non-signaling hypotheses, controls are included for personal tax and free cash flow effects.

The empirical tests confirm the theoretical predictions. In both univariate and multivariate frameworks, the signaling variables are significantly different from zero and possess the anticipated sign. The market-to-book ratio possesses the anticipated sign and is significantly correlated with the CARs in the univariate tests, but is not robust to multivariate specifications. While the personal tax effect control variable is significant at the 10% level in a multivariate test including only the general control variables and the tax variable, it is not significant in a univariate framework or in the full model. The free cash flow (agency cost) variable is not significant in either the univariate or multivariate frameworks. The lack of significance between the competing hypotheses and the announcement reaction in the full model is consistent with the argument that the impact of the non-signaling hypotheses is muted for REITs. With the impact of the other potential theories mitigated, the empirical tests clearly demonstrate that managerial signaling is a significant determinant of the stock price reaction to an open market share repurchase announcement.

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## Endnotes

- <sup>1</sup> A sample of operating firms eliminates financial firms, utilities, and closed-end funds.
- <sup>2</sup> The focus of this paper is to test the validity of the signaling hypothesis as an explanation for the positive stock price reaction to repurchase announcements. There is a related literature that deals with the issue of why a firm would choose to repurchase shares. For example, Dittmar (2000) tests the hypothesis that firms repurchase shares to counter the dilution from the exercise of executive stock options. While this is a plausible motivation for the repurchase, the hypothesis does not attempt to explain or predict an announcement stock price reaction to the repurchase.
- <sup>3</sup> Ciochetti, Craft and Shilling (2000) report that institutional owners held 53% of REIT shares in 1998. Because of the dividend tax exclusion enjoyed by many institutional owners, high institutional ownership in REITs may be indicative of a pro-dividend clientele.
- <sup>4</sup> During the sample period, REITs offered \$157.7 million in debt issues. Of that amount, \$107.0 million was in asset-backed securities. So 67.8% of the debt issued by the REITs during the sample period was directly collateralized.
- <sup>5</sup> The SDC contains 260 REIT repurchase announcements from 1980 to 1999: 20 tender offers and 240 open market repurchases.

- <sup>6</sup> To allow for inflation effects, all data items measured in dollars are adjusted to 1999 purchasing power using the Consumer Price Index. Here “immediately” means the most currently available data prior to the event.
- <sup>7</sup> The study samples with replacement. In total, the sample consists of 194 announcements by 132 REITs.
- <sup>8</sup> The authors thank Bob McIntyre for providing the tax data.
- <sup>9</sup> To insure that clustering of the observations in 1998 and 1999 does not induce bias into the results, the subsequent OLS models are also estimated with dummy variables for announcements in 1998 and in 1999. The results are robust to this perturbation.
- <sup>10</sup> For robustness, in unreported tests, the study uses a value-weighted index and a non-announcing REIT index in lieu of the equally-weighted index. In addition, a two-year pre-announcement period is used in lieu of the six-month pre-announcement period. The results are qualitatively and significantly robust to these perturbations.
- <sup>11</sup> The tax legislation relevant for the study includes: The Economic Recovery Tax Act of 1981, The Tax Equity and Fiscal Responsibility Act of 1982, The Deficit Reduction Act of 1984, The Tax Reform Act of 1986, the Omnibus Budget Reconciliation Acts of 1990 and 1993, and the Taxpayer Relief Act of 1997.
- <sup>12</sup> As additional treatments for time clustering, a model is estimated with year dummies and treated for heteroscedasticity using White’s (1980) correction. The results are robust to these alternate specifications.
- <sup>13</sup> In unreported tests, the results are robust to alternate CAR measures (two-day CARs using day  $-1$  and day  $0$ , as well as day  $0$  and day  $+1$ , the one-day AR for day  $0$ , and the three-day CAR for day  $0$ , day  $+1$  and day  $+2$ ).
- <sup>14</sup> In unreported tests, the robustness of the event study was checked by using a non-announcing REIT index over the sample period. The index includes all REITs that did not announce a repurchase program for a year surrounding the REIT in question’s announcement date. Thus, the REIT index is inter-temporally dynamic and security specific in nature. All of the results reported in Exhibits 5 and 6 are qualitatively robust and statistically significant when the REIT index is used.
- <sup>15</sup> All variance inflation factors are less than two, which indicates that multicollinearity is not a concern in the analysis.

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