The Role of Managerial Stock Option Programs in Governance: Evidence from REIT Stock Repurchases

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Abstract
This paper examines the role of stock option programs and executive holdings of stock options in REIT governance. We study the issue by analyzing how the market reaction to a stock repurchase announcement varies as a function of the individual REIT’s governance structure. In particular, we examine how executive and employee stock option holdings influence the market reaction to a firm’s announcement of a stock repurchase. Using a sample of REIT repurchase announcements, we find that the market reacts more favorably to announcements by firms where executives have larger option holdings and the CEO is not entrenched. Our results with respect to the roles of stock option holdings of executives and non-executives differ from those reported for a cross section of non-REIT firms. While we find evidence supporting the importance of executive stock options in aligning the incentives of management and reinforcing the positive signaling associated with a repurchase announcement, we find little evidence that the market views REIT repurchases as being used primarily to fund option exercise. We attribute these findings to greater dependence by REIT investors on internal governance mechanisms (such as stock option programs) as a result of regulatory restrictions that limit external monitoring such as hostile takeovers.
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Despite extensive research in the area, there remains a significant unresolved issue about the relationship between employee stock option programs and the market reaction to repurchase announcements. A primary rationale for employee option programs is to enhance incentives for hard work and to align the interests of managers and shareholders (Tirole, 2006). If the market believes that managers have sufficient incentive to act in the best interests of shareholders, it should react favorably to an announcement of a share repurchase – believing that managers are acting to signal undervaluation or to reduce excess cash flow. Babenko and Vedrashko (2007) provide theoretical and empirical support for a positive relationship between equity holdings of managers and the market’s reaction to a repurchase announcement. On the other hand, other research (see Dittmar, 2000, for a review) has shown that managers with large holdings of options have a personal incentive to substitute repurchases for dividends (substitution effect) and to undertake repurchases to fund future option exercises and avoid diluting the share value by issuing new stock (funding effect). Using a large cross-section of firms, Kahle (2002) finds evidence for both the substitution and funding effects and reports that the cumulative abnormal return associated with a repurchase announcement is smaller for firms with large option programs. In this paper, we contribute new evidence about the relationship between abnormal returns surrounding repurchase announcements and employee option programs using a data set of real estate investment trusts (REITs) that reduces potentially confounding effects.

REITs have long been used as a natural laboratory to test a number of corporate finance theories. REITs are especially useful for studying corporate governance issues because certain REIT regulations (e.g., those limiting hostile takeovers) have the effect of eliminating important
market-based mechanisms for dealing with agency problems.⁴ As a result, board structure, compensation arrangements, capital structure and other internal mechanisms for aligning management interests play a more significant role with REITs than traditional corporations. For example, Hartzell, Sun and Titman (2006) use REITs as a way to demonstrate a significant relationship between various corporate governance mechanisms and a firm’s investment decisions, and Ghosh and Sirmans (2006) find a relationship between corporate governance mechanisms and REIT dividend payout policy. REITs are especially useful for studying the relationship between abnormal repurchase returns and employee option programs because the required dividend payout helps control for the free cash flow incentives. Further, their common financial attributes, including high levels of tangible assets, high leverage and limited accumulations of cash through retained earnings helps control for alternative market interpretations of the motive for a share repurchase.

We study the role that stock option programs and other internal governance mechanisms play in overall REIT governance by analyzing how these factors influence the market reaction to the announcement of a stock repurchase. A major rationale for offering executive and employee stock option programs is the expectation that holdings of stock options will align management incentives with the goal of shareholder wealth maximization and thereby reduce the need for costly monitoring mechanisms. However, in a study of repurchase announcements by a large cross section of firms, Kahle (2002) finds a negative relationship between the total size of a firm’s option program and the market reaction to a repurchase announcement.⁵ She attributes this somewhat counter-intuitive finding to the fact that firms with large programs generally prefer to fund the exercise of employee options through open market repurchases rather than newly issued stock to avoid diluting the stock. Because an open market repurchase undertaken
to fund employee option exercises does not signal any new favorable information to the market and because the likelihood that a repurchase announcement is motivated by the need to fund option exercise increases with the size of the program, she argues that the market discounts the potential favorable aspects of an announcement by a firm with a large option program.

Our paper differs from previous studies of the relationship between stock option holdings and repurchase announcements because we control for tax effects and industry effects by restricting the sample to REITs while also controlling for the firm’s choice of internal governance mechanisms. We find a statistically and economically significant positive relationship between vested executive options and the market reaction to the announcement of a stock repurchase. We attribute the difference between our results and Kahle’s results to the greater dependence of REIT shareholders and investors on managerial compensation mechanisms to maintain incentive alignment of managers. We also find that the market reacts less favorably to announcements by firms where the CEO has long tenure. We attribute this result to market skepticism about the motives of entrenched management.

The remainder of the paper is organized as follows. The first section reviews the literature on stock repurchase announcements and develops our hypothesis for why the market should react differently to a share repurchase announcement by a REIT with a large option program. The data used in the analysis are described in the second section, and the results are reported and discussed in the third section. The final section concludes the paper with a summary.
Literature and Hypothesis

Starting with Dann (1981) and Vermaelen (1981), a series of authors have demonstrated that repurchase announcements are associated with a significant positive change in the repurchasing firm’s stock price. Although a number of explanations for the favorable market reaction have been put forward, the two most commonly cited explanations are the signaling theory and the agency cost (free cash flow) theory. The signaling theory posits that management uses a stock repurchase to signal favorable information to the market. For example, if management believes that the current market price of the firm’s stock does not accurately reflect the firm’s future prospects and that the firm is “undervalued,” it can use an open market repurchase to signal this belief. The agency or free cash flow explanation for the market’s favorable reaction is based on the work of Jensen and Meckling (1976) and Jensen (1986). These papers pointed out that access to excess cash flow encourages managers to take actions for personal benefit (e.g., paying above average wages or using excessive perquisites) at the expense of the shareholders. The distribution of free cash flow to the shareholders mitigates this agency problem and forces managers to be more disciplined in their investment decisions. A large body of empirical work has provided support for these explanations, and a recent study of REITs (Brau and Holmes, 2006) has provided evidence in support of the signaling motivation for REIT repurchases.

The number of repurchase announcements increased dramatically in the 1990s, and in 1998 U.S. corporations distributed more cash to investors through repurchases than through cash dividends. The pace and extent of the growth of stock repurchases raise questions about the completeness of the two standard explanations. Unless the majority of firms were “undervalued” or faced with the problem of excess cash flows, the extent of stock repurchases is puzzling. Recent research has begun to explore other possible explanations for the rapid expansion.
One strand of that research has focused on the fact that the growth of share repurchases coincided with the growth of managerial stock option programs. The standard rationale for stock option programs is that they help align the incentives of management with the objectives of shareholders by linking the compensation and wealth of managers to the wealth of shareholders.

The existence of stock option programs provides three additional possible explanations for the increased use of stock repurchases. First, to the extent that managers are properly incented to maximize shareholder value, they will be more likely to make every effort, including the effort to undertake open market repurchases of the firm’s stock when appropriate, to maximize shareholder wealth. Simply stated, stock option programs reinforce the traditional signaling and agency cost motives for stock repurchases by linking management’s wealth to the share price.

Second, stock option programs encourage managers to substitute stock repurchases for dividends. This effect is often referred to as the substitution effect. The substitution effect arises because dividend payments lower the value of unprotected stock options held by employees and managers. Thus, when managers hold large option positions, it is in their self-interest to substitute repurchases for dividends as a vehicle for distributing capital to shareholders. Lambert, Lanen and Larcker (1989) provide early evidence that the adoption of an option program for senior managers leads to a reduction of dividends relative to the otherwise expected level.

Third, firms with significant executive and employee options outstanding may be motivated to undertake stock repurchases because of the dilution effect resulting from the issuance of new
shares to meet their obligations resulting from the exercise of vested options. Managers with large option holdings prefer to have a smaller number of higher-priced shares outstanding and thus prefer to meet the firm’s option obligations by buying shares on the open market. This last motivation is referred to as the funding motivation for repurchases.

Several studies, including Jolls (1998), Bartov, Krinsky and Lee (1998), Fenn and Liang (2001), Kahle (2002) and Ghosh et al. (2008), have focused on the role that executive stock option holdings play in determining corporate payout policy. These studies show a positive relationship between executive stock options and the likelihood that a firm will use an open market stock repurchase program to return capital to investors. While the observed positive relationship between executive stock option holdings and the likelihood of a repurchase is consistent with the substitution effect, as pointed out in Ghosh et al. (2008), it is also consistent with the argument that managerial stock options help align management’s interests with those of shareholders.10

Kahle (2002) undertook an extensive analysis of the role that stock options play in both the firm’s decision to undertake a repurchase and the market’s reaction to the announcement. Using data on both executive and non-executive option holdings, including details about the number of exercisable and non-exercisable options within each category, she analyzes the market reaction to repurchase announcements by a broad cross section of firms (excluding regulated and financial firms such as REITs) and finds evidence supporting both the substitution effect and the funding effect. She argues that option holdings by executives and non-executives should have different effects on the market’s perception of the information conveyed by a repurchase announcement. First, since managerial holdings of options could serve to align the incentives of management with those of other shareholders, the market may interpret an announcement by a
firm where managers have large option holdings favorably, leading to a positive coefficient on executive holdings of options and support for the alignment effect. However, to the extent that firms use repurchase programs to fund exercised options, the market reaction to such announcements should be diminished. Kahle (2002) uses non-executive holdings of options as a measure of the funding incentive and predicts a negative coefficient on non-executive option holdings in a cross section regression of abnormal announcement returns on control variables and detailed option ownership. In her sample, Kahle (2002) finds a marginally significant negative relationship between the percentage of non-executive option holdings and the market reaction, and interprets this result as support for the funding hypothesis. Although she finds a positive coefficient on executive holdings, the coefficient is not statistically significant. Based on the two estimated coefficients and the average allocation of options between executives and non-executives, Kahle’s results suggest that the funding effect has a larger impact on the market’s reaction and thus announcing firms with larger option programs experience lower market reactions to repurchase announcements. Although Kahle controlled for the standard financial and tax–related factors that can influence the reasons for and hence the market’s reaction to a repurchase, she does not control for the firm’s existing governance mechanisms. Because the market’s interpretation of the meaning of a share repurchase may be influenced by the nature of the firm’s existing monitoring and governance mechanisms, in this paper we control for both financial and governance influences.

Babenko and Vedrashko (2007) develop a theoretical model that predicts that larger managerial ownership prior to a repurchase announcement adds credibility to the undervaluation signal and should result in a more favorable market reaction. Because repurchase announcements by U.S. firms do not obligate management to actually undertake a repurchase, they argue that managerial
ownership is one of the few actions managers can take to add credibility to the signal component of the announcement. The authors use a cross-section of firms (including financial and regulated firms) to test their predictions and find a positive relationship between managerial shareholdings and the market’s reaction to an announcement. They also find that the effect is most significant for firms with greater information asymmetry, as measured by the dispersion of analyst earnings forecasts. The authors do not find a significant relationship between exercisable managerial options and the market reaction.

Brau and Holmes (2006) studied the market response to repurchase announcements in the REIT context. Consistent with earlier finance literature, these authors document a significantly positive market reaction to repurchase announcements by REITs and find a strong relationship between the market reaction and the variables typically used to proxy for undervaluation, thereby supporting the signaling motivation. Brau and Holmes (2006) do not consider or test the role that stock option holdings or other governance mechanisms play in shaping market reaction to repurchase announcements.

In this paper, we analyze how stock option holdings of executives and non-executives influence the market reaction to repurchase announcements by REITs. By focusing exclusively on REITs, we control, at least partially, for variations in external monitoring. Furthermore, we extend the analysis in Kahle (2002) by also controlling for alternative internal governance mechanisms. Because REIT regulations limit some forms of external market discipline of managers (e.g., by making hostile takeovers more difficult), we expect that REIT shareholders place greater importance on internal governance mechanisms, including stock options, to align management and shareholder interests. By controlling for alternative governance mechanisms, we expect that
the measures of stock option holdings may have different effects on the market reaction for REITs than they did in Kahle’s sample of non-REIT firms. In particular, we expect that larger stock option holdings, especially by executives, will contribute to an overall favorable market reaction to announcements by firms with large option programs because we expect that the positive alignment effect will dominate any negative implications arising from the funding effect or substitution effects. We further believe that the market interpretation of the alignment effect associated with large option holdings can be influenced by existing governance mechanisms. For example, it may be harder to alter the incentives of entrenched managers with option programs, and consequently the marginal alignment effect of additional option holdings for those firms may be smaller, leading to a smaller favorable market reaction to a share repurchase announcement.

Briefly summarizing our results, using a sample of eighty-six repurchase announcements by equity REITs over the period 1997-2004, we find that cumulative abnormal returns (CARs) surrounding REIT repurchase announcements are positively related to executive holdings of stock options, especially their holdings of vested options. We further find that the positive effect from option holdings can be reduced by a negative effect associated with management entrenchment as measured by CEO tenure. We interpret our results as supporting the importance of stock option programs in aligning management incentives for REITs because the market interprets announcements by firms where the managers hold a significant amount of stock options more favorably than announcements by firms without stock options.

A major contribution of this paper is its finding that, after controlling for alternative governance mechanisms, managerial compensation structure has significant valuation implications for
REITs. Over the last few years, several papers have focused on the efficacy of various governance mechanisms in REITs (Ghosh and Sirmans, 2003, 2006, and Hartzell, Sun and Titman, 2006). In general, these studies suggest that the governance structure and regulatory environment of REITs are not conducive to effective external monitoring of managers. They further suggest that internal governance mechanisms should play a more significant role for REITs because of the limitations on external mechanisms, including hostile takeovers. Our paper makes a significant contribution to this literature by providing evidence that managerial ownership of stock options has a significant positive influence on the market valuation of REITs.

Data and Methodology

We identify all open-market stock repurchases by equity REITs reported in the Securities Data Corporation’s (SDC) U.S. Mergers and Acquisitions database over the period from 1997 to 2004. There were 132 such announcements, but requiring complete data in COMPUSTAT and requiring data on common stock returns from CRSP for at least five months prior to the announcement reduces the sample size to 111. We manually collected data on total options outstanding (both executive and non-executive) and, for each category of holder, identified options exercisable and non-exercisable. All option data were collected from proxy statements and annual reports published in the year of the repurchase announcement. Failure to find the required option information reduced the sample to ninety-six observations. For each of these observations, we collected data on board composition, share ownership and the CEO (e.g., tenure and compensation) from the proxy statements and SEC filings. An additional ten observations were dropped for missing governance data, leaving a final sample of eighty-six observations over the period 1997 to 2004 of which twenty-eight are second (or higher) announcements by the same REIT.
Table 1 provides a summary description of the eighty-six repurchases in our sample. As measured by the number of repurchase announcements, 1998 and 1999 were peak years. However, when measured by the dollar value of the shares targeted, repurchase activity was highest in 2004. Overall, the pattern of repurchase activity shown in Table 1 is consistent with the patterns observed in Kahle (2002), Grullon and Michaely (2004) and Babenko and Vedrashko (2007). Table 1 also shows that, on average, the REITs in our sample sought to repurchase 7.3% of the firm’s outstanding shares.12

**Dependent Variable: Cumulative Abnormal Announcement Return**

The dependent variable in our analyses is the CAR over a 3-day interval (-1, 0, 1) surrounding the repurchase announcement. The CAR is calculated for each repurchase in the sample using the standard market-model event study methodology. The CRSP value-weighted index is used as the market index and the estimation period is set as the five months preceding a date one month prior to the repurchase announcement.

**Independent Variables**

The independent variables used in this study of abnormal announcement returns fall into four categories: 1) stock option variables, 2) signaling variables, 3) a measure of free cash flow and 4) variables that control for the standard governance mechanisms. Our selection of variables for the first category is based on Kahle (2002), while our selection of variables for the next two categories is based on Dittmar (2000) and Stephens and Weisbach (1998) as well as Kahle (2002). Our selection of governance variables is based on the work of Hartzell, Sun and Titman (2006) and Ghosh and Sirmans (2006). Because our sample is limited to REITs, we do not need to include the variables measuring potential tax benefits (e.g., tax loss carryforwards) that other
studies have required. However, the same restriction to REITs means we have fewer degrees of freedom and thus need to be parsimonious in our selection of control variables. We discuss the variables in each category below.

Stock Option Variables. Following Kahle (2002), we collected data on the total number of options outstanding, and on the total number of exercisable and non-exercisable options owned by executives and non-executives from the annual proxy statements and 10-K filings issued in the year of the announcement. The option holdings were all normalized by dividing by the total number of shares outstanding as of the end of the year prior to the repurchase announcement.

Signaling Variables. Because one of the major reasons for the signaling motivation is management’s perception that the firm is undervalued, we include a measure of the recent relative performance of the firm’s stock prior to the announcement. Market participants are less likely to view a firm that has experienced a large recent run-up in relative stock value as being undervalued, and so we predict a negative sign for the coefficient on this variable. Following Kahle (2002), we measure relative stock performance over a forty-day period ending prior to the three-day event window. We define the relative performance using the cumulative abnormal stock return from day -43 to day -4, obtained from the standard market-model event study methodology.

Because managers can also use repurchases to signal new information about the firm’s future growth opportunities, we use the ratio of market value (defined as the sum of book value of total debt, market value of equity, and book value of preferred stock) to book value of total assets as a
proxy for the market’s current assessment of the firm’s growth prospects. All variables in the calculation are collected from Compustat. We expect that market participants are less likely to interpret a repurchase announcement as signaling unexpected good future investment opportunities when the market-to-book ratio is already high, and so we expect a negative coefficient on this variable.

Firm size is typically used as a control variable within this category as a proxy for asymmetric information between insiders and investors. When outsiders are at a large informational disadvantage in evaluating the value of a firm’s assets or its future prospects, managerial signaling with respect to those items takes on additional importance. It is generally believed that large firms are more closely monitored by analysts and institutional investors and are therefore less subject to asymmetric information problems. Firm size is measured as the natural logarithm of market value of the firm at the end of the year prior to the announcement in constant 1997 dollars. We also include the size of the repurchase announcement, measured by the percentage of total outstanding shares sought, to proxy for the strength of the signal. The underlying rationale is that a larger program represents a stronger signal. The percent sought is defined as the total number of shares targeted in the repurchase announcement expressed as a percentage of the total number of shares outstanding at the announcement as reported by the SDC database.

*Free Cash Flow.* As discussed earlier, firms with free cash flow or large cash balances are particularly vulnerable to the agency problems described by Jensen and Meckling (1976) and Jensen (1986). The issuance of long-term debt is commonly viewed as one mechanism to address this agency problem because it commits management to making regular debt service payments. While high levels of leverage could serve as a substitute for a repurchase in that both
reduce the agency problems associated with excess cash, high levels of debt also serve as an internal monitoring and alignment mechanism. The willingness of management to undertake an equity repurchase in the face of significant existing debt payment obligations could serve to enhance the favorable signal about future prospects. We control for the firm’s leverage in our regression analyses using the ratio of the book value of total debt to the book value of total assets.  

**Governance Control Variables.** Following Hartzell, Sun and Titman (2006), we include two variables as proxies for the effectiveness of board monitoring of management. First we include the natural logarithm of board size. Yermack (1996) finds that smaller boards provide stronger monitoring. In addition, we include the percentage of the board accounted for by independent board members. We defined a board member to be independent if he/she was not an executive (or retired executive) and did not have a reportable business relationship with the firm. Boards with a larger percentage of independent members should provide better monitoring of management. (See Weisbach, 1988.)

We include two variables related to ownership in the regressions: the percentage of shares owned by institutional investors and the percentage held by block-holders. We expect large institutional investors and block-holders to have both the incentive and the ability to monitor effectively. We collected data on total institutional ownership from SNL, and data on total shares held by block-holders from the proxy statements. We defined a block-holder as any individual or institution reported as owning five percent or more of the firm’s outstanding shares.
To measure the potential entrenchment of the CEO, we collected information on the CEO’s tenure. Berger, Ofek and Yermack (1999) rationalize the use of tenure as a proxy for entrenchment by arguing that managers gain more control over a firm’s internal monitoring mechanisms as their tenure increases. They also point out that an entrenched manager who is immune to dismissal (where entrenchment might be attributable to other factors) will exhibit long tenure. Consistent with these arguments, we expect CEO’s who have been in their position for a long time to be more insulated from board monitoring and pressure.\textsuperscript{21} We collected this information from the firm’s proxy statement in the year of the repurchase announcement. Finally, we include an indicator variable, UPREIT, to identify those firms that are designated Umbrella Partnership REITs. UPREITs can potentially acquire properties at lower prices because they enable certain sellers to defer the tax on gains but also face certain additional governance challenges.\textsuperscript{22}

**Summary Statistics**

Summary statistics of the variables used in the study are reported in Table 2. The average CAR for the sample of eighty-six equity REIT repurchase announcements is 1.13 percent.\textsuperscript{23} The first group of explanatory variables in the table includes the various measures of stock option holdings by executives and employees of the announcing firms. For our sample of REITs, option holdings by executives and non-executives combined represent 6.7 percent of total shares outstanding. Option ownership is approximately evenly distributed between the two groups. Slightly more than half of the outstanding options are exercisable for each owner group. In the sample used in Kahle (2002), management held only a third of the exercisable options while in our sample, executives held roughly half of the total exercisable options. Since new option
programs often favor executives over the general employees, these contrasting patterns suggest a shorter lifetime since inception for REIT option programs.\textsuperscript{24}

The next two groups of variables in Table 2 include the control variables for the signaling motivation and the free cash flow motivation. As in most previous studies, the typical REIT announcing a repurchase experienced a negative abnormal return over the forty days prior to the announcement window. This evidence is consistent with the expectation that managers announce repurchases following poor market performance, possibly to signal a view different than the market’s. The average market-to-book ratio for the sample of REITs is 1.05, significantly lower than the market-to-book ratio of 1.71 for repurchasing firms in Kahle’s sample. The lower market-to-book ratio in our sample is consistent with the concentration of tangible real estate assets in REIT portfolios and the high dividend payout of REITs.\textsuperscript{25} The average asset size of the REITs in the sample, measured in terms of book value and market value, is just under $2 billion. The distribution of firm size exhibits significant variability and is skewed to the right. On average, REITs targeted the repurchase of 7.3 percent of outstanding shares – a fraction larger than total outstanding options and roughly twice the number of exercisable options. This suggests that the announcements were not motivated solely to fund the near-term exercise of options.\textsuperscript{26}

The leverage ratio of REITs in our sample is approximately forty-five percent, as expected much higher than the average of eighteen percent reported by Kahle.\textsuperscript{27} The final group of variables includes measures of corporate governance. The average board size is between eight and nine members, with roughly two-thirds of the board members being independent. Institutional ownership accounts for approximately half of the shares outstanding and block-holders account
for roughly twenty percent. The average CEO has held that position for five years. We measured tenure in integer years, with a minimum of one year. Since tenure cannot be negative, the distribution of tenure is skewed to the right and consequently we use the natural log of tenure in our models.

**Results**

We use ordinary least squares to analyze the cross section of CARs from our sample. We report the results of these regressions in Table 3. The analysis comprises four separate specifications, all of which are estimated using the same sample and the same dependent variable. The first model includes only the traditional financial explanatory variables (i.e., the signaling and free cash flow variables discussed above) and serves as a base case for the remaining three models that include the different measures of the stock option holding variables and governance variables. In Model 1, we find that the short-term run-up variable is highly significant and enters the model with the expected negative sign. This is consistent with the signaling hypothesis. The coefficient of firm size is negative and significant, supporting the argument that asymmetric information is somewhat less of an issue with large firms. Although the signs on the other signaling variables are consistent with theory, the coefficients are not significant. In a similar specification, Brau and Holmes (2006) found only the run-up variable to be significant and concluded that their analysis provides support only for the signaling motive. Kahle (2002) reports results similar to ours, although the percentage of shares sought at the announcement is marginally significant in Kahle’s data.

Models 2 and 3 add variables measuring option holdings to the base model. Following Kahle, we look at both the total size of the program (using total options outstanding) and the number of
exercisable options. Model 2 includes total executive and total non-executive options outstanding. The executive option variable has a significantly positive coefficient while the non-executive coefficient is not significant. The relationship between total executive option holdings and abnormal returns is economically significant - a one percentage point increase in the proportion of executive options outstanding implies a 32 basis point increase in the average CAR. The negative sign of the coefficient on non-executive options is consistent with Kahle’s result, but it is not significantly different from zero. Although a zero coefficient would mean that the option funding hypothesis does not affect repurchase-induced valuation effects in REITs, the negative point estimate suggests a modest offset to the favorable alignment effect from granting executives options. In fact, the relationship between the total size of the firm’s option program and the market reaction is positive but not significant. The pre-announcement stock performance is still significantly negative in this specification, but the coefficient on the market value of the firm is smaller and is no longer significant.

Model 3 is similar to Model 2 but uses exercisable option holdings in place of total options. In theory, vested options should have more alignment effect and should also be more closely related to the funding effect. The coefficient on exercisable executive options in Model 3 is larger (than the coefficient in Model 2) and reflects a more significant economic effect (a one percent increase in exercisable options results in a 69 basis point larger market response) than did the total executive options. This suggests that the market recognizes the alignment of interests to be stronger when managerial options are vested. The point estimate of the coefficient on non-executive holdings is negative but not significant. As with Model 2, the relationship between the total size of the option program and the abnormal announcement return is not significant. The
coefficients on the variables that proxy for signaling are all similar to those estimated in Model 2, but the coefficient on leverage is now significant with the expected positive coefficient.

Model 4 estimates the full model specification that includes the exercisable option holdings, financial control variables, and controls for other aspects of the firm’s overall governance. Within the newly-added governance variables, the coefficient on CEO tenure is negative and statistically significant. This suggests that the market reacts more skeptically to a repurchase announcement when the CEO is entrenched. The estimated effect is economically as well as statistically significant. For example, a one standard deviation increase in CEO tenure from the mean of 5.06 years to 8.01 years is estimated to reduce the market reaction by 45 basis points.

We do not find a significant relationship between the abnormal returns and any of the other measures of governance. This may be the result of the fact that different firms use different combinations of governance mechanisms to accomplish the same monitoring end. For example, block holders may substitute for large institutional ownership or an independent board. These offsets make it difficult to precisely estimate governance effects in small samples. The estimated coefficients on the option variables are not significantly changed by the inclusion of the governance variables, but the point estimate of the leverage coefficient is substantially larger and the coefficient is significant at the five percent level. This finding confirms that adjusting leverage can be another tool that corporations use to align incentives and that the effect of this variable was obscured until we controlled for other governance mechanisms. The positive effect is consistent with the view that higher levels of leverage serve to enhance the credibility of the favorable signal about future prospects associated with a repurchase announcement.
Overall, we find significant evidence that stock option holdings serve to align managerial incentives with shareholders’ objectives. The market responds more favorably to repurchase announcements by firms where executives have significant holdings of exercisable stock options. We also find that the market reacts less favorably to announcements by firms where the CEO has held that position for a long period and may be entrenched. Although our findings differ from those of Kahle in certain respects, they are generally consistent. Kahle’s point estimates show a positive relationship between announcement CARs and executive option holdings (but the effect is not statistically significant in her data) and a statistically significant negative relationship with non-executive option holdings. Based on this, she concludes that the funding effect dominates in the market’s assessment of the overall impact of the option program. Our point estimates have the same signs, but we find the positive effect of managerial holdings to be significant while the negative relationship with non-executive holdings is not significant in our data. Our results suggest that for REITs, the positive effect from managerial alignment is stronger and dominates any possible negative funding effect. We attribute this result to the greater importance of using compensation-based alignment mechanisms in REITs than in standard corporations because REIT regulations limit other market-based monitoring and control of management actions. In the absence of other strong evidence of managerial alignment, market participants have less confidence that a REIT repurchase announcement is being undertaken for their benefit. It appears that large executive holdings of exercisable options provide that evidence while long CEO tenure is interpreted negatively.

One reason that the funding effect could be weaker for REITs than it was in Kahle’s sample is the difference in the maturity of REIT stock option plans. Total options outstanding and total options exercisable in our sample of REITs represent a smaller share of the total shares
outstanding than in Kahle’s sample. Executives in our sample hold a much larger fraction of the
total options than do executives in Kahle’s sample. These differences are consistent with the
hypothesis that REIT option programs are younger than those of other industrial corporations
and thus REITs have less need to purchase shares to fund a significant demand for shares
resulting from the exercise of vested shares. The lack of a strong funding effect in our data could
be at least partially a result of the relative immaturity of REIT option programs.

We tested the robustness of our results in several ways. First, we re-estimated Model 3 using
robust standard errors that allow for the possibility that the observations (error terms in the
sample) are not identically distributed. We use the Huber/White sandwich estimator of the
variance covariance matrix provided by STATA. The revised standard error for the managerial
option holdings increases and the estimated p-value increases from .01 to .03. At the same time,
the p-value for the CEO tenure coefficient declines from .090 to .054. Overall, the conclusions
discussed above are the same. We also estimated standard errors using the cluster option that
allows for the possibility that observations from the same firm may not be independent. The
interpretation of which variables are significantly related to the abnormal announcement returns
is unaffected by using the cluster option.

As noted earlier, the data include twenty-eight firms that announce more than one stock
repurchase. To test whether the inclusion of these observations affects our conclusions, we re-
estimated Model 4 including an indicator variable for second repurchase announcements. The
indicator is not significant and the point estimates and significance levels of the variables of
interest are not affected. We also re-estimated Model 4 restricting the sample to first
announcements. We find that the coefficient on exercisable executive stock options is significant
and positive and the coefficient on the stock run-up variable is significant and negative as in Model 4. However, with the smaller sample size there is a loss of precision in estimating the effects of leverage and CEO tenure. While the signs on these variables are the same as in Model 4 and the point estimates of the coefficients are quite similar, the coefficients are no longer significant at standard thresholds. Overall, these results indicate that our results are not driven by the inclusion of second announcements.

Finally, we tested our results for undue influence by outliers. To do this, we first calculated the “leverage” of each observation. As discussed in Belsley, Kuh and Welsh (1980), leverage is defined as the diagonal elements of the projection or “hat” matrix of independent variables and provides a measure of how atypical a particular observation is in a multivariate sense. Belsley, Kuh and Welsh (1980) suggest scrutinizing any observation with leverage greater than 2k/n, where k is the number of independent variables and n is the sample size. We re-estimated Model 3, excluding the four observations with leverage that exceeded that threshold and obtained essentially similar results.

Several recent finance papers (e.g., Flannery and Rangan, 2006 and Babenko and Vedrashko, 2007) have used the “Winsorizing” technique to adjust for outliers in their independent variables. Winsorizing entails replacing the h most extreme values for a variable with the h-1 value. For example, consider a single explanatory variable. Babenko and Vedrashko (2007) replace all values above the 99th percentile value with the 99th percentile value and similarly adjust the values that fall below the first percentile. We Winsorized (using thresholds of 5% and 95% to trigger the adjustment) all explanatory variables used in Model 4 and re-estimated the model.
The results were qualitatively and quantitatively similar to those reported in Table 3. Thus our results seem quite robust to outliers among the independent variables.

Our data include certain observations where the observed CAR is significantly above or below the mean CAR. We have reviewed all such observations carefully and have no reason to believe that the data are erroneous or that the unusual CAR is due to confounding effects. There is one observation where the CAR falls more than three standard deviations above the mean. We re-estimated the model excluding that observation and the coefficient on management’s exercisable options is still statistically and economically significant with a one percent increase in holdings leading to a 42 basis point increase in estimated abnormal return.

**Conclusions**

The late 1990s witnessed a surge in both the use of open-market repurchase programs as a mechanism to return capital to shareholders and the use of stock option plans to align the interests of managers and shareholders. This paper addresses the issue of how stock option ownership by employees and management relate to valuation effects surrounding stock repurchase announcements for REITs. We find that executive ownership of stock options is positively related to the abnormal announcement return. This finding is consistent with the argument that managerial stock options serve to align managerial interests with stockholders’ objectives. Our results also show that the market reacts more skeptically to a repurchase announcement when the CEO is apparently entrenched. This reflects the fact that some reasons for undertaking a repurchase (e.g., to avoid dilution or minimize dividends) have less favorable implications for shareholders than the frequently cited signaling or agency motives. When the
CEO is strongly entrenched as reflected by long tenure in the position, the market places higher weight on these less favorable motivations.

Our results differ in interesting ways from those of Kahle (2002), who studied how stock option ownership influences market reaction for non-REIT firms. In particular, we find much stronger evidence of a positive relationship between abnormal announcement returns and managerial stock option holdings than did Kahle. The effect is most significant for executive holdings of vested options. We attribute this difference to the greater importance of compensation based alignment mechanisms for REITs resulting from the weaker market-based monitoring associated with the REIT structure and corresponding regulations limiting takeovers. We do not find statistically significant evidence for the negative funding effect documented by Kahle, but our point estimate is consistent in sign. We attribute this difference to the relative immaturity of REIT stock option plans. Overall, we find a positive, but statistically insignificant, relationship between the size of a firm’s option program and the market reaction whereas Kahle found a negative relationship, on average. The fact that the market reacts more favorably to repurchase announcements by firms with substantial stock option programs reflects the much larger importance of compensation based monitoring and alignment for REITs.
We are grateful to the Special Issue Editors, Bradford Case and Dennis R. Capozza, and three anonymous referees for their comments and suggestions.
References


Table 1 presents the mean (standard deviation) of announced repurchases for the sample of 86 REITs by calendar year. Both the dollar value of the repurchase and the percentage of outstanding shares sought are taken from the SDC database.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Repurchases</th>
<th>Dollar Value of Repurchases (mil.)</th>
<th>Percentage Sought</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>8</td>
<td>14.84</td>
<td>5.78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.10)</td>
<td>(4.24)</td>
</tr>
<tr>
<td>1998</td>
<td>16</td>
<td>20.28</td>
<td>6.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(18.84)</td>
<td>(3.31)</td>
</tr>
<tr>
<td>1999</td>
<td>41</td>
<td>57.26</td>
<td>8.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(67.86)</td>
<td>(5.0)</td>
</tr>
<tr>
<td>2000</td>
<td>7</td>
<td>61.70</td>
<td>7.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(55.82)</td>
<td>(4.22)</td>
</tr>
<tr>
<td>2001</td>
<td>4</td>
<td>245.17</td>
<td>6.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(308.31)</td>
<td>(3.53)</td>
</tr>
<tr>
<td>2002</td>
<td>5</td>
<td>82.08</td>
<td>6.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(69.82)</td>
<td>(2.11)</td>
</tr>
<tr>
<td>2003</td>
<td>1</td>
<td>36.90</td>
<td>5.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(--)</td>
<td>(--)</td>
</tr>
<tr>
<td>2004</td>
<td>4</td>
<td>268.54</td>
<td>6.43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(232.29)</td>
<td>(2.55)</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>66.57</td>
<td>7.29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(109.94)</td>
<td>(4.28)</td>
</tr>
</tbody>
</table>
### Table 2
Summary Statistics for Sample of 86 REIT Repurchase Announcements

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Abnormal Return CAR(-1,0,+1)</td>
<td>1.13%</td>
<td>3.51%</td>
<td>-10.05%</td>
<td>17.14%</td>
</tr>
</tbody>
</table>

| Stock Option Variables | | | | |
| Total Options Outstanding/Shares Outstanding | 6.69% | 3.26% | 0.08% | 16.10% |
| Executive Options Outstanding/Shares Outstanding | 3.24% | 2.24% | 0.00% | 10.06% |
| Non-executive Options Outstanding/Shares Outstanding | 3.45% | 2.15% | 0.08% | 9.84% |
| Total Options Exercisable/Shares Outstanding | 3.70% | 2.12% | 0.01% | 12.73% |
| Executive Options Exercisable/Shares Outstanding | 1.85% | 1.47% | 0.00% | 6.86% |
| Non-executive Options Exercisable/Shares Outstanding | 1.85% | 1.44% | 0.01% | 6.97% |

| Signaling Variables | | | | |
| Stock Run-up before Announcement (days-43 to -4) | -5.29% | 7.58% | -25.31% | 19.38% |
| Ratio of Market Value to Book Value (EOY prior to announcement) | 1.05 | 0.24 | 0.72 | 2.30 |
| Book Value (EOY prior to announcement), $mil. | 1,893 | 2,989 | 44 | 21,100 |
| Market Value of Firm (EOY prior to announcement), $mil. | 1,896 | 2,892 | 100 | 20,542 |
| Natural Log of Market Value of Firm (in $bil.) | 0.04 | 1.06 | -2.30 | 3.02 |
| Percent of Outstanding Shares Sought | 7.29% | 4.28% | 1.28% | 23.62% |

| Free Cash Flow Measure | | | | |
| Leverage (Book Debt/Total Assets--EOY prior to announcement) | 0.45 | 0.12 | 0.12 | 0.82 |

| Governance Control Variables | | | | |
| Board Size | 8.35 | 2.16 | 4.00 | 15.00 |
| Percent of Board Independent | 64.37% | 12.53% | 28.57% | 90.00% |
| Percent of Shares Owned by Institutions | 50.56% | 21.88% | 4.17% | 89.06% |
| Percent of Shares Owned by Blockholders | 20.99% | 15.78% | 0.00% | 69.22% |
| CEO Tenure (years) | 5.06 | 2.95 | 1.00 | 20.00 |
| UPREIT (yes=1) | 0.87 | 0.34 | 0.00 | 1.00 |

**Notes:**
1. Sample comprises all REIT Repurchase announcements between 1997 and 2004 for which complete data were available.
2. The CAR(-1,0,1) was calculated using standard event study methodology and the CRSP value-weighted index.
3. Financial data were obtained from COMPUSTAT. The market value of the firm is defined as the book value of debt plus the market value of equity and the book value of preferred stock.
4. Option variables and governance data was obtained from the proxy statements in the year of the announcement.
5. Institutional ownership data was obtained from SNL and is based on 13-f filings.
### Table 3

**OLS Estimates of Models of Abnormal Announcement Day Returns**

(Coefficients above, t-statistics below in parentheses)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stock Option Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Executive Options Outstanding/Shares Outstanding</td>
<td>0.3234 **</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.99)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-executive Options Outstanding/Shares Outstanding</td>
<td>-0.0432</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-.26)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Executive Options Exercisable/Shares Outstanding</td>
<td></td>
<td>0.6883</td>
<td>0.7408</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.88) ***</td>
<td>(2.88) ***</td>
<td></td>
</tr>
<tr>
<td>Non-executive Options Exercisable/Shares Outstanding</td>
<td>-0.2110</td>
<td>-0.3531</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-.90)</td>
<td>(-1.39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Signaling Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stock Run-up before Announcement (days-43 to -4)</td>
<td>-0.1977 (-4.33) ***</td>
<td>-0.1768 (-3.77) ***</td>
<td>-0.1764 (-3.93) ***</td>
<td>-0.1678 (-3.58) ***</td>
</tr>
<tr>
<td>Ratio of Market Value to Book Value (EOY before announce.)</td>
<td>-0.0211 (-1.41)</td>
<td>-0.0201 (-1.35)</td>
<td>-0.0208 (-1.44)</td>
<td>-0.0243 (-1.54)</td>
</tr>
<tr>
<td>Natural Log of Market Value of Firm (EOY before announce.)</td>
<td>-0.0060 (-1.85)</td>
<td>-0.0044 (-1.29)</td>
<td>-0.0030 (-0.91)</td>
<td>-0.0054 (-1.17)</td>
</tr>
<tr>
<td>Percent of Outstanding Shares Sought</td>
<td>0.0011 (1.28)</td>
<td>0.0008 (0.98)</td>
<td>0.0010 (1.23)</td>
<td>0.0010 (1.14)</td>
</tr>
<tr>
<td><strong>Free Cash Flow Measure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leverage (LT debt/Total Assets--EOY before announce.)</td>
<td>0.0397 (1.38)</td>
<td>0.0447 (1.57)</td>
<td>0.0478 (1.72)</td>
<td>0.0619 (2.06) **</td>
</tr>
<tr>
<td><strong>Governance Control Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Log of Board Size</td>
<td>0.0103 (.64)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of Board Independent</td>
<td>-0.0001 (-.30)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of Shares Owned by Institutions</td>
<td>0.0001 (.39)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of Shares Owned by Blockholders</td>
<td>0.0156 (.61)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Log of CEO Tenure (years)</td>
<td>-0.0098 (-1.72) *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UPREIT (yes=1)</td>
<td>-0.0100 (-.77)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.0024 (-.11)</td>
<td>-0.0118 (-.51)</td>
<td>-0.0136 (-.62)</td>
<td>-0.0141 (-.26)</td>
</tr>
<tr>
<td>Number of Observations</td>
<td>86</td>
<td>86</td>
<td>86</td>
<td>86</td>
</tr>
<tr>
<td>F-Statistic</td>
<td>5.27</td>
<td>4.42</td>
<td>5.32</td>
<td>3.27</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0003</td>
<td>0.0004</td>
<td>0.0001</td>
<td>0.0006</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.25</td>
<td>0.28</td>
<td>0.32</td>
<td>0.37</td>
</tr>
</tbody>
</table>

**Notes:**

1. The dependent variable in all four model specifications is the 3-day abnormal announcement return, CAR(-1,0,1).
3. CARs were calculated for each announcement using standard event study methodology and the CRSP value-weighted index.
4. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.
ENDNOTES

1 As reported by Tirole (2006), a typical executive compensation package comprises three components: base salary, bonus, and stock-based compensation. The latter two components represent the incentive-based compensation and are intended to help align managers’ incentives with shareholder objectives. In general, the stock-based compensation accounts for the bulk of the incentive compensation. Several factors help explain the preponderance of stock option programs over direct stock awards during the time period we study. First, from a theoretical point of view, owners can provide more incentive per dollar of cost through option programs. Second, during the time period of our study, most firms did not recognize the cost of stock option awards until the options were exercised.

2 Babenko and Vedrashko (2007) argue that sizeable executive shareholdings reinforce the positive signaling component of a repurchase announcement by making the undervaluation signal more credible, and also that large shareholdings create an impediment to firms that are not undervalued but want to mimic the favorable signal.

3 REITs are useful in these studies because their unique regulations result in greater homogeneity in certain control variables. The legislation that created REITs provides that as long as a REIT meets certain shareholder diversification, asset composition, income source and distribution requirements, it is entitled to a special “dividends-paid” tax deduction that can fully offset taxable income. The asset composition rules require that at least seventy-five percent of a REIT’s assets must be in the form of real estate-related assets, cash and government securities. The distribution rules require that REITs distribute at least ninety percent of pre-tax net income. (Prior to 2001, the payout requirement was ninety-five percent.) The repurchase of outstanding shares does not reduce a REIT’s obligation to distribute earnings via dividends.

4 See Campbell, Ghosh and Sirmans (1998) for a discussion of how REIT regulations limit hostile takeovers. The most significant impediment is a common provision in REIT charters that allows management to suspend voting and dividend rights for shares held by shareholders who exceed a designated percentage—frequently ten percent. This provision is included in REIT charters to enable management to meet the shareholder distribution requirements, which prohibit the five largest shareholders from controlling more than fifty percent of the outstanding shares. However, the rule also provides management a powerful anti-takeover threat.

5 Kahle (2002) reports results for a model specification that decomposes the total outstanding options into those held by executives and those held by management, and does not report a model specification that includes only the overall size of the program. In one model specification, she finds a weakly significant positive coefficient on executive option holdings but also finds a larger (in absolute value) negative coefficient on non-executive holdings of options. Given the average distribution of holdings by executives and non-executives, her estimated coefficients result in a negative relationship between the overall size of the program and the market reaction for the typical firm.

6 Other explanations for the positive market reaction include increasing leverage and tax effects. See Grullon and Ikenberry (2000) and Dittmar (2000) for a review of the literature on firm motivation for repurchase programs.

7 See Jensen (1986) and Easterbrook (1984) for further discussion.

8 Dittmar (2000) provides a comprehensive empirical analysis of motives for stock repurchases. Other studies include Kahle (2002), Stephens and Weisbach (1998), and Fenn and Liang (2001) to cite just a few. In a working paper, Ghosh, Harding, Sezer and Sirmans (2000) report the results of a survey of senior officers of REITs that had undertaken repurchase programs. Perceived undervaluation of the firm’s stock was the most commonly cited motive, closely followed by the desire to signal better future prospects. Reducing takeover risk and substituting for dividends over the required limit were reported as “Not Important” by the vast majority of respondents.

9 Grullon and Ikenberry (2000).

10 Ghosh et al. (2007) restrict their analysis to REITs and argue that REITs have less flexibility to substitute repurchases for dividends because, in order to maintain their tax-advantaged status, REITs must pay out at least ninety percent of pretax income in the form of dividends. They further argue that their finding of a significant positive relationship between managerial option holdings and the likelihood of announcing a repurchase program indicates a significant alignment effect from stock option programs in REITs. Lee, Hsieh and Peng (2005) provide empirical support for the claim that REITs have less dividend payout flexibility by showing that the payout rate for a sample of repurchasing REITs did not differ significantly from that of a sample of non-repurchasing REITs. Skinner (2006) provides evidence that non-REIT firms coordinate dividend payouts and total repurchases to maintain a consistent aggregate payout rate.
For example, if a firm has other strong monitoring and governance mechanisms in place, investors may not place much weight on a single alignment mechanism such as option holdings.

In the U.S. it is difficult to obtain precise data to measure the ex-post number of shares repurchased by a firm using an open market repurchase program because the firm is not obligated to disclose the number of shares acquired. Consequently, there is a significant range of estimated completion rates in the literature ranging from 18% to 75%. Stephens and Weisbach (1998) used the quarterly decline in shares outstanding as a proxy for the shares repurchased and estimated that approximately 75% of repurchase programs by non-REIT firms were actually carried out. Giambona, Golec and Giaccotto (2006) applied the same methodology to a sample of REIT repurchases between 1997 and 1999 and found a similar completion rate for REITs. Their data show that, on average, an announcing REIT’s shares outstanding decline 4.7% one year after a repurchase announcement and 5.7% two years after the announcement. Adams, Brau and Holmes (2007) report an estimated completion rate of approximately 50% for REIT repurchases between 1989 and 2001. Based on these estimates from different but overlapping periods, we are confident that the REITs in our sample were retiring shares.

Most of the financial variables used in the study are as of the end of the year prior to the announcement. Because proxy statements are generally issued in the period from March to May and report option holdings as of a specified date in the current year, the “as of” date for financial data deviates somewhat from the “as of” date for the options data.

Our choice of specific measures for recent relative performance is based on the work of Comment and Jarrell (1991).

Our results are little changed if we use book value in place of market value.

Because of the asset composition rules and the minimum dividend payout requirement, REITs have relatively limited free cash flow or excess cash on their balance sheets. While these factors reduce certain agency problems such as excess perquisite consumption, they do not mean that REITs experience lower agency problems overall – just a different mix of agency problems. For example, overinvestment or empire-building could be significant problems because REIT owners have limited ability to monitor such investment decisions.

Previous studies of non-REIT firms have used measures of balance sheet cash, dividend payout rate, or free cash flow as additional proxies for agency problems associated with excess cash. We explored the possibility of using dividend payout rate but found that there was limited variability in REIT payout ratios (due to the regulatory requirement described earlier) and as a result we could not find a significant relationship between these measures and the market reaction to announcements. We also considered using the percentage of assets held in the form of cash and marketable securities. However, on average, REITs in our sample held less than 1.5% of their assets in cash (compared with more than 8% in Kahle’s sample of non-REIT firms) and there was relatively limited variability in this measure as well.

Qiu (2004) and Chen, Hartford and Li (2005) find a positive correlation between institutional ownership and performance of bidder firms involved in acquisitions, suggesting that managers of firms with significant institutional ownership are more prudent in their acquisitions.

SNL data are based on 13-f filings.

Because some reported block-holders are institutions, there is some overlap in these two measures.

To the extent that entrenched managers are insulated from the normal internal monitoring mechanisms, the shareholders and board will need to place additional emphasis on incentive compensation such as stock options in order to maintain the same overall level of control over the standard agency problems that arise between managers and shareholders.

For a complete discussion of the potential conflicts of interest in both standard REITS and UPREITs, see Sagalyn (1996).

The average CAR is 1.17 percent when we use the equally-weighted CRSP index as a benchmark. The average CAR is 1.16 percent for our sample excluding multiple announcements by the same REIT.

Closer inspection of the data suggests a relationship between firm size and the number of exercisable options held by executives. We compared the mean firm size for firms where the executive holdings of exercisable options fell in the top quartile of all firms to the mean size for firms where executive holdings fell into the bottom quartile. (It should be noted that these two groups comprised only twenty-two observations each.) Similar comparisons for leverage and board composition showed that top quartile firms used lower leverage and smaller boards. There were no other significant differences in means between these two subsamples.
Brau and Holmes (2006) report an average market-to-book ratio of 1.9; however, their sample differs significantly from ours. First, Brau and Holmes (2006) include all REIT types while our sample is restricted to equity REITS. Second, their sample period (1982-1999) includes the “start-up” years for REITs while our sample period (1997-2004) does not.

In Kahle (2002), firms sought to repurchase 6.4 percent of outstanding shares – a fraction somewhat smaller than that of total options (7.8 percent) but still significantly larger than exercisable options (4.0 percent).

See Giambona, Harding and Sirmans (2008) for a thorough discussion of the determinants of REIT capital structure.

Estimating Model 2 with only the total size of the program included generates a coefficient on total options outstanding of 0.14 with a t-statistic of 1.31.

The projection matrix is defined as $X(X'X)^{-1}X'$, where $X$ represents the $n$ by $k$ data matrix. It is referred to as the “hat” matrix because $[X(X'X)^{-1}X']y = \hat{y}$. 