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Abstract

Recent papers have shown that managers time their equity offerings based on the value of share prices relative to the book value of the firm or recent share price changes. We utilize special attributes of real estate investment trusts (REITs) to show that deviations in the relative value of share prices impact managers' decisions to issue equity and repurchase shares. First, we show that the ratio of price to net asset value (NAV) strongly predicts whether managers issue or repurchase shares. This relationship is non-linear. Managers rarely issue equity when price-to-NAV is below one and rarely repurchase shares when price-to-NAV exceeds unity. Second, we demonstrate that available information is an important factor in determining the stock market response to changes in outstanding shares. Stock prices respond more strongly to announcements of share issuances and repurchases when NAV is unavailable. For REITs with NAV estimates, the announcement effect depends on the price-to-NAV ratio. When price-to-NAV equals one, we cannot reject that the announcement effect equals zero for both repurchases and offerings. Taken together, our results suggest that investors are aware of managers' attempts to time the equity market and respond accordingly.

I. Introduction

Equity prices are tied to active changes in a firm's shares outstanding. For example, a firm's stock price usually falls when it issues new (seasoned) equity, while its share price rises when the firm announces a plan to repurchase its shares.[1] A typical new equity offering can result in a decline in the value of existing shares of as much as 30 percent of the value of the stock raised in a seasoned equity offering (Asquith and Mullins, 1986).[2] Most research attributes these findings to the fact that shareholders realize that managers have superior information about the firm's current value and future prospects and penalize a firm that adjusts its capital structure in ways that may take advantage of future buyers (or sellers) of their securities (Myers and Majluf, 1984).

Below, we examine the factors that drive firms to adjust their shares outstanding and how investors respond to these capital structure adjustments. In doing so, we take advantage of a special type of firm, real estate investment trusts (REITs), which have characteristics that allow us to expand upon the results from previous research. Analysts typically evaluate REITs by appraising their properties, which provides a more accurate estimate of a REIT's net asset value (NAV) than is available for industrial firms, where researchers have typically used the book value of assets to proxy for the extent to which a firm is over- or under-valued.[3] One such set of appraisal-based NAV estimates, from Green Street Advisors (the best known REIT analyst), provides the key variable for our empirical analysis.

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[1]For evidence on seasoned equity issuances, see Asquith and Mullins (1986), Masulis and Korwar (1986), Mikkelson and Partch (1986),

[2] For example, if announcing an offering that is 10 percent of shares outstanding results in a 3 percent decline in the stock price, then the announcement effect is roughly 30 percent of the proceeds of the equity raised.

[3] One paper that uses appraisals--Aboody, Barth, and Kasznik 1999–shows that revaluations of fixed assets can help predict future firm performance in UK companies.

In addition to access to high-quality estimates of the market value of the assets inside the firm, REITs are a useful vehicle to study equity issuance and repurchase decisions for three other reasons. First, special tax rules for REITs reduce the role of taxes in explaining capital structure choice. REITs receive a deduction for dividends paid, which mostly eliminates the tax arguments for taking on debt instead of equity and the incentive to repurchase shares instead of paying dividends.[4] Second, as part of the special tax rules, REITs must pay out the bulk of their taxable income as dividends. Thus, REITs must distribute more than one-half of their cash flow, giving them less discretion to fund new investment with retained cash. In addition, they must go to the capital markets to finance new investment of any significant scale, so all REITs can be considered "equity dependent firms." Thus, REIT equity issuances arguably face a smaller asymmetric information problem than equity issuances of industrial firms that have more discretion to raise capital with internally-generated cash flow because potential investors understand that REITs may often need to issue equity. Third, most REITs tend to have relatively low debt levels and stable cash flows, so bankruptcy seems less likely than for other public companies.

We are interested in two questions. First, do estimates of the under- or overvaluation of a firm's shares (relative to the value of its assets) affect managerial decisions about when to repurchase shares or issue equity? Second, conditional on observing share repurchases or equity offerings, are these estimates of under- or overvaluation relevant for how the market responds to the "news" embodied in the announcement?

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[4] Once a REIT has distributed all of its income as dividends, additional distributions will be characterized as a return of capital, which does not face dividend taxation but does lower the shareholder's tax basis. By lowering the tax basis, the return of capital is taxed as a capital gain, which is normally the tax-motivation for repurchasing shares rather than paying dividends.

For the first question, we estimate whether the ratio of price-to-NAV predicts repurchase and equity offering decisions.[5] For repurchases, our estimates imply that a REIT with a price-to-NAV ratio of 0.9 has a roughly 19 to 22 percent chance of announcing a repurchase plan in the year, compared to a 14 percent chance of announcing a repurchase if the price-to-NAV stays at 1.0. This effect is non-linear, so that repurchase plans are rarely announced or executed at times when price-to-NAV exceeds unity, but the likelihood of announcing rises rapidly when price-to-NAV falls below unity. For equity issuances, we find that a high price-to-NAV ratio predicts that a REIT is more likely to issue new shares. As with repurchases, this effect is non-linear with the effect of the price-to-NAV ratio much stronger when the ratio is above one. Essentially, when the price-to-NAV ratio is below one, REITs rarely issue new shares. These results are consistent with managers attempting to time the equity market in making decisions about share repurchases and equity issuances.

Given the apparent attempts by managers to time their equity issuances and repurchases, we are interested in whether the stock market reaction to firms' activities in the equity market are related to perceived under- or overvaluation of the shares. How does analyst information affect the market reaction to announcements? The estimates of under- or overvaluation from Green Street are only contemporaneously available to some investors. Therefore, these estimates are not broadly known by market participants; however, the trades of the informed investors or further research around announcements could impact share prices.

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[5] In addition, as we discuss below, firms covered by Green Street are more likely to both repurchase shares and issue shares than are firms that are not covered by Green Street, which suggests that either Green Street's coverage decision is non-random or that analyst coverage makes it easier to undertake these activities.

For this question, we exploit two types of variation. First, we examine whether news of an announcement has a different effect on firms that are not covered by Green Street than on firms that are covered by Green Street. We finding striking evidence that the non-covered firms have much more pronounced stock market reactions to announcements than do the covered firms. For example, we find that REITs that are not covered by Green Street who issue seasoned equity have abnormal returns of about -0.60 percent over a three-day event window compared to only -0.33 percent for the covered firms.[6] For repurchases, this pattern is even more pronounced in absolute value for repurchase announcements, with share prices of covered firms rising only one-sixth as much (0.7 percent) as the stock prices of non-covered firms (4.3 percent) over the same 3-day event window. This evidence suggests that analyst coverage might drastically reduce the asymmetric information problem, resulting in smaller (absolute) changes in share prices associated with active changes in equity outstanding, possibly leading to a greater likelihood of managers making active adjustments to the amount of equity.

Second, we explore whether the announcement effects are related to analysts' perceptions for REITs that are covered by Green Street. When we interact the price-to-NAV ratio with the three-day event window, we find that share prices increase less for repurchase announcements by firms with relatively high price-to-NAV ratios and fall less when firms with relatively low price-to-NAV ratios announce a seasoned equity offering. In fact, the estimates show that most of the announcement effect is due to the fact that they typical REIT that issues seasoned equity has a price-to-NAV ratio above one, while REITs that repurchase shares have a price-to-NAV ratio

[6] Even the non-covered REITs have a smaller response than the negative excess returns associated with seasoned equity offerings for the utilities in Asquith and Mullins' (1986) study, which is consistent with REITs having less severe asymmetric information problems than other firms.

below one. For REITs with a price-to-NAV equal to one, we cannot reject that there is a zero announcement effect both for announcements of repurchases and seasoned equity offerings. Together, these facts suggest that the market uses information about the relative value of the firm in determining its response to changes in capital structure. REITs that announce repurchases when the relative valuation of their shares is low get very big benefits, while REITs that issue equity when the relative valuation of their shares is high incur a greater price penalty. Thus, announcements effects appear strongest when the manager's "signal" is consistent with the analysts' perception.

Section II briefly summarizes the literature, while Section III provides a background on REITs. Section IV describes the data, including the NAV estimates from Green Street Advisors. Section V examines the propensity of firms to repurchase or issue new shares. Section VI considers the stock market reaction to the announcement of a seasoned equity offering or a repurchase plan. Section VII concludes with brief comments on future research directions.

II. Previous Literature

Given the negative excess returns associated with new equity issuances, researchers have examined the factors that drive firms to issue seasoned equity. For example, a firm is much more likely to issue equity after a pronounced run-up in the price of its shares or when its book-to-market value is high (Taggert, 1977, Marsh, 1979, Asquith and Mullins, 1986, Korajczyk, Lucas, and MacDonald, 1991, Jung, Kim, and Stulz, 1994, and Hovakimian, Opler, and Titman, 2001). At the aggregate market level, firms are more likely to issue shares relative to debt prior to periods of low market returns (Baker and Wurgler, 2000). Managers respond in surveys that they issue shares based on the relative value of their shares (Graham and Harvey, 2001).

Moreover, the negative impact of a new equity issuance on share prices is not limited to the period around the announcement date. Subsequent to issuing seasoned equity, firms also earn lower returns than their peers (Spiess and Affleck-Graves, 1995 and Loughran and Ritter, 1995).

Conversely, when companies want to return capital to shareholders in the form of share repurchases, shareholders appear to view this as a positive signal.[7] Conditional on announcing a repurchase plan, a company's share prices tend to rise immediately, but also exhibit excess returns on a longer-term basis, as well (Ikenberry, Lakonishok, and Vermaelen, 1995). Firms may also repurchase shares in an attempt to manage earnings per share (Bens, et. al., 2002).

An implication of this research is that managers take advantage of their superior knowledge of both the firm's and the market's prospects to adjust capital structure in ways that benefit current shareholders and that the market is sometimes slow to respond. Nonetheless, other alternative explanations for this evidence have been raised, including differences in risk (Eckbo, Masulis, and Norli, 2000), the desire to re-optimize overall capital structure, and tax avoidance.

An alternative approach to examining managers' intentions is to directly examine the role of information in the negative announcement effect for seasoned equity offerings by comparing differences in announcement returns across various types of firms or over time. For example, Asquith and Mullins (1986) show that the negative returns associated with announcing new equity offerings are much smaller for utility companies compared to industrial firms, possibly due to greater predictability of new capital needs or the relative homogeneity of utility

[7] The literature has also examined differences in the choice between repurchases and dividends. The findings suggest that managers will typically choose dividends to distribute "permanent"increases in cash flows, while they use repurchases to distribute cash flow that is more transient in nature (Jagannathan, Stephens, and Weisbach 2000 and Guay and Harford 2000).

companies. Korajczyk, Lucas, and MacDonald (1991) find that the price drop at the announcement of an equity offering is smaller if the announcement is closer to an information release (such as an earnings report), when the authors argue that asymmetric information should be less of a problem. Finally, Bayless and Chaplinsky (1996) show that the price reaction to the announcement of an equity issuance is smaller during "HOT" periods when many other firms are issuing equity relative to "COLD" periods when fewer firms are issuing new equity, which they interpret as evidence that firms are more likely to use equity finance at times when asymmetric information is less of a problem.

III. Background on REITs

With certain key tax-related exceptions, REITs are similar to other corporations. Like other corporations, REITs often initiate operations by raising capital from external markets and investing the capital in operating assets. To qualify as a REIT, among other things, a firm must meet certain asset and income tests that set minimum levels of real estate activity to prevent REITs from using their tax-advantaged status to move into other business areas. REITs must earn at least 75 percent of their income from real estate related investments and 95 percent of their income from these sources as well as dividends, interest and gains from securities sales. In addition, at least 75 percent of their assets must be invested in real estate, mortgages, REIT shares, government securities, or cash. While older REITs were often passive investors, several changes in tax rules in the late 1980s allowed REITs to actively manage their assets during the 1990s. Although some REITs invest in real estate mortgages, we restrict our focus to equity REITs, which primarily invest in rental properties.

In addition to the asset and income tests, tax law requires REITs to pay out a minimum percentage of their taxable income as dividends each year. For most of our sample period, this percentage was 95 percent; however, tax changes in 2000 reduced the minimum percentage to 90 percent. This distribution requirement is based on taxable income rather than financial reporting income. Despite this requirement, REITs have some discretionary cash flow because operating cash flow typically exceeds taxable income, especially since depreciation allowances reduce taxable income but not cash flow. In general, however, the distribution requirement limits REITs' ability to finance investment with internally generated funds, so they uniformly rely more heavily on secondary equity issues than do regular corporations.

The benefit of qualifying as a REIT is avoiding the double taxation of equity-financed investment. Unlike regular corporations, REITs receive an annual tax deduction for dividends paid out to shareholders. REITs often distribute all of their taxable income to shareholders each year, which eliminates the corporate tax altogether.

IV. Data Description

Our sample period begins in 1994 , the first year for which we can obtain announcement data on repurchases and seasoned equity offerings from SDC, and ends in 2001. The number of equity REITs shrunk modestly from 175 in 1994 to 151 in 2001, but the average size of a REIT grew several fold, with the industry equity market capitalization growing from $39 billion in 1994 to $147 billion in 2001, resulting in a strong gain in liquidity and trading volume.[8]

[8] Industry statistics are from the National Association of Real Estate Investment Trusts' website at www.nareit.org.

The relatively straightforward nature of REITs' assets (compared to industrial firms) leads many analysts to value REITs by appraising their properties. The key explanatory variable for our empirical work is one set of these appraisals from Green Street Advisors, Inc. Green Street computes Net Asset Value (NAV) based on the estimated market value of each REIT's assets by assessing the value of the major properties of a REIT and subtracts the liabilities of the REIT. Green Street's goal is to compare the market value of the REIT's common stock with the market value of the underlying assets (after adjusting for other ownership claims). They use these estimates to advise clients (often large institutional investors) on selecting REITs as investments. While Green Street provides NAV estimates for 40 percent of equity REITs in 2001, the firms they cover represent 75 percent of REIT value.

Several factors motivate using the Green Street NAV estimates. Industry observers and participants almost uniformly agree that Green Street produces the most careful and accurate estimates in the REIT industry. It is the only analyst firm to have a consistent set of estimates prior to 1996. Green Street focuses exclusively on real estate firms and each of its analysts follows only a few firms. These analysts specialize by type of property and compute NAV by determining the fair market value of each property owned by a REIT, often visiting larger properties. Finally, over this time period, Green Street performed no investment banking functions for REITs, so it is immune from the potential conflicts of interest that may impact the research of banks that underwrite securities.

We use the Green Street estimates of NAV as a measure of the underlying value of a REIT's assets. An important question to keep in mind is whether the Green Street estimates are public information available to all investors or private information that is only available to the managers of the firm and certain private investors. We believe that the Green Street information

is somewhere between public information and purely private information. Green Street uses its information to help its clients form portfolios so they have an incentive to retain the information in order to maximize the returns of their clients; however, the trading activity of these clients could affect share prices. At the other end of the spectrum, managers presumably have an even better idea of the fair market value of their properties than would the outsiders at Green Street; in part, even if the managers knew Green Street's NAV estimates, they may have differences of opinion over the accuracy of these estimates.

Our key explanatory variable is the ratio of the REIT's share price (taken from data from the University of Chicago's Center for Research in Security Prices (CRSP)) to Green Street's estimate of the REIT's NAV. Over our sample period, the mean (median) share-price-to-NAV ratio is 1.04 (1.01). While the central tendency of this ratio is close to one, there is substantial variation both over time and within time periods. Figure 1 plots the 25th percentile, median, and 75th percentile price-to-NAV ratio by month for 1992-2001. The time series plot reveals a strong industry-wide component to the price-to-NAV ratio with the median value exceeding 1.20 for all of 1997 but being below 0.9 for most of 2000. Clayton and MacKinnon (2000) argue that this industry-wide component represents a form of investor sentiment for REITs. The spread between the 25th and 75th percentile of the monthly distribution has narrowed over time.

In addition to the NAV estimates from Green Street and share price data, we need information on the timing and size of equity issuances and share repurchases. We rely on data from SDC both for the size of the announced issue and the announcement date. For the event studies, we augment the dates listed in SDC by checking the Dow Jones News Retrieval Service to make sure that press accounts did not report the event before the date recorded by SDC. In the

rare event that we could find a previous press announcement before the SDC announcement date, we use the date of the press account as the date for the event announcement.

As discussed by Jagannathan, Stephens, and Weisbach (2000), measuring share repurchase activity is more difficult than measuring secondary offerings for several reasons. First, firms can announce repurchase plans without following through on the plan. Second, while firms typically announce plans, the actual date of the repurchase need not be announced in advance. Given the complications in measuring repurchase activity, we use two different measures. First, we use the earlier of an SDC announcement date and a press account of an announcement. Second, we measure decreases in shares outstanding using the CRSP data. As an overall measure of net equity issuance and repurchase activity, we use the month-to-month percentage change in shares outstanding, as measured using the CRSP data.

Overall, after matching the data sources and restricting the sample to US equity REITs, we obtain information on 70 REITs and 384 firm-years with non-missing NAV data (i.e., that are covered by Green Street) and 176 REITs and 1,662 firm-years that are not covered by Green Street and thus do not have a reported value for NAV. Table I provides some basic summary statistics on the subsample of REITs that are covered by Green Street.

V. Determinants of Share Repurchases or Issuance

Our primary focus in this section is to examine how a firm's stock price relative to the value of its underlying assets affects the decision to repurchase or issue equity. Since this analysis requires having data from the analysts at Green Street, we begin by comparing the impact of analyst coverage on propensity to repurchase or issue shares. This comparison provides some idea of whether the firms covered by Green Street are a select sample in terms of

their repurchase or secondary offering behavior. Table II shows annual announcements of repurchases (Panel A) and seasoned equity offerings (Panel B), by year and whether or not the REIT was covered by Green Street as of January 1 for that year.

The panels of the table indicate that the firms covered by Green Street are considerably more likely to announce a share repurchase or an equity offering than the firms that are not covered by Green Street. For repurchases, 61 of the 384 REIT-year observations (16 percent) covered by Green Street have a repurchase announcement compared to only 100 of the 1662 REIT-year observations (6 percent) of the firms not covered by Green Street. For equity offerings, 128 of the 384 covered observations (33 percent) announce equity offerings compared to 162 of the 1662 uncovered observations (10 percent).

This comparison suggests that the REITs covered by Green Street are not representative of the overall population. However, the reason the selected sample is different than the uncovered REITs is unclear. One explanation would be that Green Street tends to cover REITs that tend to engage in more equity market transactions; for example, Green Street may want to cover fast-growing REITs (which are more likely to issue equity) since it concentrates on larger REITs. Alternatively, more analyst attention (even by analysts who do not underwrite securities) may reduce some of the costs associated with issuing equity such as the costs associated with asymmetric information so that covered firms find it easier to issue equity than non-covered firms.[9]

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[9] While both of these explanations suggest that firms covered by Green Street may be more likely to issue equity, it is less clear that these explanations drive the observed differences in repurchase behavior. REITs that repurchase shares are less likely to grow than REITs that do not repurchase shares and analyst coverage may be a substitute for the signaling benefits of a repurchase rather than complementary to a repurchase. That is, if repurchases are motivated by signaling private information, there might be less scope for signaling by firms that are covered by analysts.

Table II also provides evidence on the propensity of REITs to repurchase and issue shares over time. For both firms covered by Green Street and those that are not covered by Green Street, share repurchase and issuance behavior is heavily concentrated during certain periods in our data. Comparing the data in Table II with the P/NAV ratio in Figure 1, it becomes clear that the number of repurchase or offering announcements during each year of our sample is highly correlated with the overall price-to-NAV ratio. Equity issuance is concentrated in 1995 - 1997 when price-to-NAV was relatively high but the repurchase activity is concentrated in 1998 - 2000 when price-to-NAV was relatively low. Foreshadowing our regression results, equity issuance occurs more often when the price-to-NAV ratio is high but repurchase announcements occur when price-to-NAV is lower. In the regression analysis, we can include year-fixed effects so that our econometric identification comes from the variation of price-to-NAV within the year and across firms, as opposed to simply using the time series variation in the price-to-NAV ratio.

We now turn to the regression analysis using firm-level data. To focus on the extensive margin of whether a REIT is active in the external equity market, we estimate a series of separate probit regressions for whether the firm announces a share repurchase plan during the month (based on SDC data), whether its number of shares decreases during the month (based on CRSP data), whether it announces a seasoned equity issue (based on SDC data). We also run OLS regressions using the monthly percentage change in total shares outstanding (CRSP), which combines the net effect of both repurchase and seasoned equity offerings in a single variable. These data are measured on a monthly basis. The primary explanatory variable is the price-to-NAV ratio at the end of the preceding month. We also include year dummies in some regressions to capture unobservable time-specific, industry-wide unobservable effects.

As reported in Table I, for our sample, 1.1 percent of REIT-months have a repurchase plan announcement and in 4.6 percent of REIT-months the number of shares outstanding decreases. Thus, while share repurchase announcements are quite rare, repurchase activity occurs much more frequently. Announcements of equity issuance occur in 2.8 percent of the REIT-months in our sample, which implies that on average a REIT announces a seasoned equity offering about once every three years. The CRSP-based measures suggest much more frequent equity issuance behavior with the number of shares outstanding increasing in 24.0 percent of months. Many of the small increases in shares outstanding reflect compensation plans (*e.g.*, stock options) or the conversion of operating partnership units into common shares.

Panel A of Table V presents the marginal effects from the probit regressions for the different measures of share repurchase activity. Part I uses the SDC announcement measure and Part II examines the CRSP measure based on the number of shares outstanding. The first, third, and fourth columns do not control for year-fixed effects while the second column includes year-fixed effects, which have only a moderate effect on the overall regression results. The estimated coefficient on the price-to-NAV ratio is negative and statistically significant in all specifications. To interpret the coefficients, a decrease in the price-to-NAV ratio from 1.0 to 0.9, increases the monthly probability of a repurchase by 0.36 percentage points (using the coefficient in the first column), which evaluated at the mean repurchase probability is an increase from 1.1 percent to 1.48 percent. Since repurchases are relatively infrequent events, this effect may seem small at a monthly frequency. However, taken over a longer horizon, the effect seems more substantial. During a year, a REIT has a roughly 14 percent chance of announcing a repurchase and if the price-to-NAV stays at 0.9 during the year instead of 1.0, this chance increases to roughly 19 percent.

One method to examine for possible non-linearities is to use a kernel regression to plot the likelihood of announcing a repurchase on the lagged price-to-NAV ratio. Figure 2 clearly suggests that REITs are quite unlikely to announce a share repurchase when the price-to-NAV ratio exceeds one, but that the likelihood of a repurchase grows rapidly as the price-to-NAV ratio falls below one. We confirm the statistical significance of the non-linearity by splitting the sample based on whether the price-to-NAV ratio is above or below 1 (columns 3 and 4 of Part I, Table V). The price-to-NAV ratio has more than three times greater impact on the decision to announce a repurchase plan when the price-to-NAV ratio is less than unity than its impact when the price-to-NAV ratio exceeds unity.[10] For price-to-NAV ratios above 1.0, the probability of a repurchase is close to zero and does not vary much by the price-to-NAV ratio.

As reported in Part II of Table V and Figure 2, the qualitative results are similar when we base repurchase activity on shares outstanding. The marginal effects of a change in the price-to-NAV ratio are larger with this definition but the baseline probability is also four times larger, so the elasticity of repurchase behavior with respect to the price-to-NAV ratio is similar across definitions. Our general conclusion is that when price-to-NAV is low, REITs are more likely to repurchase shares, consistent with the market timing hypothesis for share repurchase activity.

Panel B of Table V presents the marginal effects from probit regressions for whether the price-to-NAV ratio affects whether firms issue shares. Once again, the first two columns report the results using the announcement of a secondary offering without and with year-fixed effects,

[10] Non-parametric kernel regressions, which we will include in future drafts, confirm these results.

respectively.[11] Whether or not we control for year effects, the estimated coefficients imply that a higher price-to-NAV ratio increases the probability that a REIT issues shares. For example, using the estimate from the first column, a 0.1 increase in the price-to-NAV ratio increases the probability of issuing equity during the next month by 0.85 percentage points. Taken from the average probability of announcing a seasoned equity offering of 2.48 percent percent during a month, this increase represents a 34 percent jump in the likelihood issuing seasoned equity. Once again, the announcement effect is strongly non-linear, as is clear in the kernel regression in Figure 3 and the parametric regressions in columns 3 and 4 (Panel B, Table V). The coefficient on price-to-NAV is twice as large when price-to-NAV is greater than unity (column 3) than when price-to-NAV is less than one.

To combine the impact of repurchases and seasoned equity offerings, Panel C examines the relationship between the percentage change in shares outstanding and the price-to-NAV ratio. Once again price-to-NAV has a strong effect on overall share issuance. However, price-to-NAV has a much stronger effect on share issuance when price-to-NAV exceeds unity. When price-to-NAV is below one, the coefficient on price-to-NAV is quite small and not close to being statistically different from zero. Overall, it appears that the effects of the stock price on share issuance are relatively more important than the effects on repurchase activity. In fact, kernel regressions (Figure 4) show that REITs with a price-to-NAV below unity still do not, on average, shrink the number of shares outstanding, while REITs with price-to-NAV above unity strongly grow the number of shares with increases in price-to-NAV.

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[11]All of the results with announcements of seasoned equity also hold if we instead use a discrete dependent dummy variable that equals one when the firm has any increase in the number of shares outstanding that month, or alternatively, whether the REIT increases shares by 0.5 percent in a month. The latter definition encompasses only larger, discrete share issuances.

While issuing and repurchasing shares is one direct mechanism for firms to change their amount of equity financing, dividend policy also affects the amount of equity financing. For many industrial firms, retained earnings far exceed the amount of financing raised by issuing shares. The distribution requirement for REITs limits their discretion over dividend policy and retained earnings. Despite the distribution requirement, REITs have some discretion whether to pay out cash flow in excess of taxable income as a tax-free return of capital distribution. Such distributions could be financed by cash flow exceeding income due to depreciation allowances, by selling assets, or by other changes in capital structure. We have data on return of capital distributions starting in 1995 for most of the firms in our sample. Overall, 52 percent of the REIT-year observations report having some return of capital component to their dividend.

By paying a return of capital distribution, a REIT reduces its reliance on equity. Put differently, by not paying (or reducing the size of) a return of capital distribution, a REIT can increase its equity-financed investment. To examine whether return of capital distributions respond to the price-to-NAV ratio, as a measure of investment opportunity, we estimate probit regressions of whether a REIT pays a return of capital distribution.

While not reported in a table, the estimated effect of the price-to-NAV ratio on the propensity to pay a return of capital distribution is negative and statistically different from zero at the 95 percent confidence level both in specifications with and without year fixed effects. Using the specification with year effects, the estimated effect suggests that if the price-to-NAV ratio is 0.1 higher at the beginning of the year, the REIT is 8.1 percentage points less likely to pay a return of capital dividend during the coming year. Thus, the firm's stock price is related to its distribution policy and the negative relationship is consistent with the investment effects and the propensities to issue or repurchase equity found in the previous sections. When the REIT has

better investment opportunities (as measured by the price-to-NAV ratio), it is less likely to pay dividends in excess of the required dividend.

Overall, if one takes the price-to-NAV ratio as a proxy for information that is known by the managers of the firm but that is only partially known by investors in the market, then the results are consistent with managers attempting to time equity markets based on their information about the firm's prospects. When managers believe that the shares of the firm are overvalued, they are more likely to issue shares; conversely, when managers believe that the shares of the firm are undervalued, they engage in repurchase activity. These signaling stories could be associated with offsetting changes in the debt of the firm. For example, when the REIT issues shares, it may use the proceeds to reduce its reliance on debt.

This asymmetric information story is, however, only one possible explanation of the observed relationship between equity issuance, repurchases, and the price-to-NAV ratio. Another possibility is that the difference between the stock price and the NAV estimate represents the quality of investment opportunities for the firm. When price-to-NAV is high, the REIT has relatively good prospects, based on the types of properties or regions in which it specializes. Recognizing these opportunities, the managers issue equity (and possibly borrow) to finance investment opportunities. In another paper (Gentry and Mayer, 2002), we examine how REIT investment varies with the ratio of price-to-NAV; we find that REIT investment, as financed with both equity and debt, responds strongly to variation in price-to-NAV.

VI. Stock Market Responses to Stock Repurchases and Offerings

As discussed in the introduction, the evidence on the stock market response to the announcement of industrial firms' equity market activity is commonly interpreted as consistent

with the signaling hypothesis. The stock market responds negatively to equity offering announcements consistent with investors interpreting the announcement as a signal that the firm is overvalued. For repurchase announcements, the abnormal returns are positive, consistent with investors interpreting the announcements as a sign that the firm is undervalued.

The Green Street estimates of NAV give us an estimate of whether the firm is under- or over-valued at a point in time and this information is only available to a limited number of market participants. In this section, we use this information as a proxy for whether the firm is under- or over-valued when it announces a share repurchase or offering. The announcement of a repurchase or offering will increase the market's scrutiny of the firm. To the extent that this scrutiny confirms (or rejects) the opinions embodied in the Green Street estimates of NAV, then the announcement effects will be correlated with the estimated price-to-NAV ratio. For example, if Green Street estimates that a REIT has a high price-to-NAV ratio when it announces an equity offering, then the market may be more likely to view the announcement negatively. For repurchases, an announcement when the firm is perceived by analysts to be undervalued may carry a stronger signal than when the analysts perceive the firm as over-valued.

The sign of the correlation between the announcement effect and the estimated price-to-NAV ratio estimated using the Green Street appraisals is an empirical issue. The managers could have different opinions than the analysts at Green Street about any mispricing in the stock; however, the estimates in the previous section are more consistent with the managers having similar opinions as the analysts. The pattern of the estimates in the previous section suggest that REITs' propensity to repurchase or offer shares is consistent with managers having private information that is positively correlated with Green Street's perception of the stock.

Repurchases are more likely when Green Street estimates that the REIT is undervalued and equity offerings are more likely when Green Street estimates that the REIT is overvalued.

In addition, the presence of Green Street coverage of a firm may also carry information about whether managers have better information about the firm than investors. To the extent that Green Street coverage reduces the information gap between managers and investors, one would expect that the managers of covered firms would have less private information that might be implicitly revealed to the market through announcement effects.

VI.A. Repurchase Announcement Effects

To examine the excess returns associated with the announcement of a REIT share repurchase and equity offerings, we use the standard event study methodology. For each announcement, we estimate a market model that allows for an event-specific constant and an event-specific market β. We include 5 years of daily returns prior to each event in our sample.[12] We estimate the abnormal returns within a three-day event window composed of the announcement day and the preceding and following trading days. The regression includes a dummy variable that takes a value of one on each of these three days for the event and a value of zero otherwise. With this convention, the three-day abnormal return is three times the coefficient on the event-window dummy variable. We examined larger windows, but found that there are no economically or statistically significant returns associated with earlier or later days in event time.

[12] While some firms have multiple announcements, we allow for event-specific parameters (rather than firm-specific parameters), thus allowing firm betas to potentially change over time. Also, some firms do not have a full five years of prior returns due to a more recent IPO. Although not reported here, we have also adjusted standard errors for the correlation across events within a firm and find this correction has little estimated effect on the standard errors.

In addition to examining whether an announcement of a repurchase or offering affects daily returns, we examine whether the percentage of shares involved in the announcement is related to the size of the announcement effect. One might expect that larger repurchases or equity offerings would have a bigger impact on the share price. To test this hypothesis, we examine the interaction between the percentage of total shares involved in the repurchase with the dummy variable for the three-day window. For equity offerings, we interact the proposed percentage increase in the number of shares outstanding with the three-day event window.

Table IV reports the event study results for the announcement of share repurchase plans. The first two columns of the table focus on REITs that are not covered by Green Street. The first column does not include the interaction with the size of the repurchase program. The estimated three-day abnormal return is 4.2 percent of the value of the stock and statistically different from zero at the 99 percent confidence level. In the second column, we find that the positive effect of announcing a repurchase plan is positively correlated with the size of the repurchase plans. In terms of magnitude, this estimated effect is similar to those found for general firms (see Ikenberry, Lakonishok, and Vermaelen, 1995).

Our main purpose in reporting results for REITs that are not covered by Green Street is to examine whether the announcement effects differ between covered and non-covered firms. The third and fourth columns of Table IV report the results for the repurchase announcements made by firms covered by Green Street. While the estimated effect of a repurchase announcement is positive and statistically different from zero at the 95 percent confidence level, the magnitude of the effect is considerably smaller for covered firms. The three-day excess return is only 0.72 percent, or less than one-fifth the size of the effect for firms not covered by Green Street.

There are two ways of interpreting the difference in the magnitude of the announcement

effects across covered and non-covered firms. First, coverage by Green Street could reduce the amount of asymmetric information between managers and investors, which reduces the scope for investors to interpret announcements as signals of mispricing. Second, Green Street could gravitate toward covering REITs that systematically have smaller information problems (e.g., Green Street tends to cover the larger firms in the industry). We cannot distinguish between these two interpretations. Either way, these results are consistent with those in Barth and Kasznik (1999), who show that firms with more intangible assets and with greater information asymmetries have larger announcement effects when repurchasing shares.

The fifth column of Table IV turn to the issue of whether the share repurchase announcement effects are related to the price-to-NAV ratio (among firms covered by Green Street). Here we supplement the basic specification of the third column with the price-to-NAV ratio and the interaction between the price-to-NAV ratio and three-day event window. The price-to-NAV ratio is as of 5 event days prior to the daily returns in the regression. Clearly, the estimated three-day abnormal return depends on the price-to-NAV ratio. REITs with lower valued shares (relative to NAV) have a larger abnormal return during the announcement window. Strikingly, for a REIT with a price-to-NAV ratio equal to one, the three-day cumulative abnormal return is 0.14 percent (i.e., 3*(0.0127 – 1.0*0.0113)), an effect that cannot be rejected as statistically different from zero (p-value=0.21). However, for a REIT with a price-to-NAV ratio of 0.9, the estimated three-day cumulative abnormal is 0.8 percent (i.e., 3*(0.013 – 0.9*0.010)). For a REIT with a price-to-NAV ratio of 0.8, that excess return increases to 1.1 percent. Notice that we also control for the direct effect of the price-to-NAV ratio on daily returns and find that this variable also strongly impacts returns. A high price-to-NAV ratio predicts lower future excess returns, suggesting some amount of mean reversion in price-to-

NAV.[13]

Thus, when Green Street's analysts predict that a REIT is undervalued by a larger amount (i.e., a lower price-to-NAV ratio), the announcement effect of a share repurchase plan is larger (more positive). This result is consistent with the managers signaling the same sort of private information that the analysts have already discovered. When there is disagreement between the "signal" (i.e., the managers announce a repurchase) and the analysts' opinions, there is a smaller market reaction. Put differently, the positive announcement effects of share repurchases are concentrated among REITs for which the semi-public information held by Green Street implies that the REIT is undervalued. These results are consistent with repurchase announcements being associated with positive excess returns on average because the average firm that announces a repurchase has a price-to-NAV ratio below one.

VI.B. Equity Offering Announcements

The results in Table V parallel those in Table IV for share repurchases except Table V concentrates on equity offerings. The dummy variable for the event window takes a value of one for the announcement day of an equity offering and for the preceding or next trading day, and it takes a value of zero for other days. The first two columns are for REITs that are not covered by Green Street (without and with an interaction with the size of the offering compared to the current shares outstanding, respectively). The three-day cumulative abnormal return is –0.60 percent and statistically different from zero at the 95 percent confidence level. Unlike the repurchase announcements, the size of the transaction does not have a statistically significant

[13] Gentry, Jones, and Mayer (2003) examines whether REIT stock price deviations from NAV estimates predict future REIT returns and find large positive excess returns to a strategy of buying REITs that trade at a discount to NAV and shorting REITs that trade at a premium to NAV.

effect on the magnitude of the announcement effect.

Again, the main reason for reporting the results for REITs that are not covered for Green Street is to examine whether the covered firms have different announcement effects than the firms that are not covered. As with the repurchase announcement effects, the estimated announcement effects are smaller for the firms covered by Green Street than for the uncovered firms. However, the magnitude of the difference is smaller for equity issuance; in this case, the effect on covered firms (-0.33 percent) is roughly half the size of the effect for the uncovered firms (-0.60 perent). This difference is consistent with the signaling effects being more important for firms that have a larger gap between what is known by the managers and what is known by investors (as proxied for by the presence of analyst coverage). This result should be viewed with caution since the estimated abnormal returns of the covered firms are of only marginal statistical significance (p-value=.10). The size of the issue has little impact on the announcement effects.

Turning to whether this effect is related to the price-to-NAV ratio (the results in the fifth column of Table V), we find that the negative effects are larger for firms that Green Street estimates are more overvalued and these estimates are highly statistically different from zero (p-value= 0.01 for the joint test that the event dummy and the interaction with price-to-NAV are equal to zero). As with the repurchase announcements, a REIT with a price-to-NAV ratio of one that announces an equity offering would have a three-day abnormal return of only 0.01 percent, which we cannot reject is different from zero with a p-value of 0.80. In contrast, a REIT with a price-to-NAV ratio of 1.2, would have an estimated abnormal return would be –0.44 percent. While smaller than the estimated effect associated with a repurchase announcement, the direction and interpretation are the same. REITs have negative returns associated with raising

seasoned equity when analysts concur that the firm is overvalued. These results suggest that managers are signaling the same sorts of information that the analysts track and that the market reacts as if the announcement validates the analysts.

VII. Conclusion

For a sample of REITs, we examine the share repurchase and equity offering behavior and the stock price consequences of the announcements of these activities. One advantage of studying REITs rather than industrial firms is that we have analyst valuations based on the appraisals of the REITs' underlying assets. These appraisals allow us to form estimates of the price-to-NAV ratio that varies over time and across firms.

We find that the analyst information is important along several dimensions. First, REITs that are covered by analysts are more active in terms of their propensity to both repurchase and issue shares. Second, analyst coverage reduces the magnitude of the estimated signaling effects associated with both share repurchases and equity offerings. Third, the price-to-NAV ratio is a strong predictor of when a firm will repurchase shares, issue equity or change its number of shares outstanding. When analysts believe that a REIT's share price is high relative to its underlying asset value, the REIT is more likely to issue equity; however, when share prices are relatively low, the REIT is more likely to repurchase shares. Fourth, the size of announcement effects for both share repurchases and equity offerings are congruent with the analysts' valuations of the REIT. The positive announcement effects of a repurchase are larger when the analysts view the firm as undervalued and the negative announcement effects of an equity offering are larger (i.e., more negative) when the analysts view the firm as overvalued. For REITs whose estimated price-to-NAV is equal to one, we cannot reject that there is no

announcement effect for either repurchases or seasoned equity offerings.

One general conclusion from our preliminary results is that analysts' information predicts both managerial behavior and investors' response to this behavior. There are a number of possible directions for future research. In this paper and previous research (Gentry and Mayer, 2002), we show that price-to-NAV impacts a REIT's investment, its overall capital structure, its propensity to issue and repurchase shares, and how the market responds to the announcement of changes in shares outstanding. However, results in Tables IV and V also show that price-to-NAV also predicts returns. We return to this issue in Gentry, Jones, and Mayer (2003) and find that price-to-NAV differences predict REIT stock returns for horizons of up to six months. We also find that differences in price-to-NAV ratios predict changes in NAV as well (i.e., the public market valuations help predict changes in private market valuations)? Finally, we would also like to examine how analyst information about relative valuation (although without the precise price-to-NAV information available for REITs) impacts announcement effects for repurchases and seasoned equity offerings with a broader set of industrial firms.

References

Aboody, D., M.E. Barth, and R.Kasznik. 1998. "Revaluations of Fixed Assets and Firm Performance: Evidence from the U.K." *Journal of Accounting and Economics*, 26(1): 149-178.

Asquith, Paul and David W. Mullins. 1986. "Equity issues and offering dilution." *Journal of Financial Economics*, 15: 61-89.

Baker, Malcolm, Jeremy Stein, and Jeffrey Wurgler. 2001. "When Does the Market Matter? Stock Prices and the Investment of Equity-Dependent Firms." Harvard University mimeo.

Baker, Malcolm and Jeffrey Wurgler. 2000. "The Equity Share in New Issues and Aggregate Stock Returns." *The Journal of Finance*, LV(5): 2219-57.

_____. 2002. "Market Timing and Capital Structure." *The Journal of Finance*, LVII(1): 1-32.

Barth, Mary E. And Ron Kasznik. 1999. "Share Repurchases and Intangible Assets. *Journal of Accounting and Economics*, 28(2): 211-241.

Bayless, Mark and Susan Chaplinsky. 1996. "Is There A Window of Opportunity for Seasoned Equity Issuance?" *The Journal of Finance*, LI(1): 253-78.

Bens, Daniel A., Venky Nagar, and M.H. Franco Wong. 2002. "Real Investment Implications of Employee Stock Options Exercises." *Journal of Accounting Research*, 40(2): 359-393.

Bens, Daniel A., Venky Nagar, Douglas J. Skinner, and M.H. Franco Wong. 2002. "Employee Stock Options, EPS Dilution, and Stock Repurchases." University of Chicago mimeo.

Clayton, Jim and Greg MacKinnon, 2000, Explaining the discount to NAV in REIT Pricing: Noise or information? Working Paper, University of Cincinnati.

Eckbo, Masulis and Norli. 2000.

Fazzari, Steven M., R. Glenn Hubbard, and Bruce C. Petersen. 1988. "Financing Constraints and Corporate Investment." *Brookings Papers on Economic Activity* no. 1 (1988): 141-195.

Gentry, William M., Deen Kemsley, and Christopher J. Mayer. 2003. "Dividend Taxes and Share Prices: Evidence from Real Estate Investment Trusts." *Journal of Finance*, 58(1): 261-282.

Gentry, William M. And Christopher J. Mayer. 2002. "What Can We Learn about Capital Structure and Investment with a Better Measure of *q*?" Wharton School mimeo.

Gentry, William M., Charles M. Jones, and Christopher J. Mayer. 2003. "Deviations between Stock Price and Fundamental Value for Real Estate Investment Trusts." Columbia Business School and Wharton mimeo.

Graham, John R. and Campbell R. Harvey. 2001. "The theory and practice of corporate finance: evidence from the field." *Journal of Financial Economics*, 60: 187-243.

Guay, Wayne and Jarrad Harford. 2000. "The Cash Flow Permanence and Information Content of Dividend Increases vs. Repurchases." *Journal of Financial Economics*, 57: 385-415.

Harris, Milton and Artur Raviv. 1990. "Capital Structure and the Informational Role of Debt." *The Journal of Finance*, 45, 321-49.

_____.1991. "The Theory of Capital Structure." *The Journal of Finance*, XLVI(1), 297-355.

Hovakimian, Armen, Tim Opler, and Sheridan Titman. 2001. "The Debt-Equity Choice." *Journal of Financial and Quantitative Analysis*, 36(1): 1-24.

Ikenberry, David, Josef Lakonishok, and Theo Vermaelen. 1995. "Market underreaction to open market share repurchases." *Journal of Financial Economics*, 39:181-208.

Jagannathan, Murali, Clifford P. Stephens, and Michael S. Weisbach. 2000. "Financial flexibility and the choice between dividends and stock repurchases." *Journal of Financial Economics* 57: 355-384.

Jensen, Michael C. 1986. "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers." *American Economic Review*, 76, 323-339.

Jensen, Michael C. and William Meckling. 1976. "Theory of the firm: Managerial behavior, agency costs, and capital structure." *Journal of Financial Economics*, 3, 305-60.

Jung, Kooyul, Yong Cheol Kim, and Rene M. Stulz. 1996. "Timing, investment opportunities, managerial discretion, and the security issue decision." *Journal of Financial Economics,* 42: 159-85.

Korajczyk, Robert, Deborah Lucas, and Robert MacDonald. 1992. "Equity Issues with Time-Varying Asymmetric Information." *Journal of Financial & Quantitative Analysis*, 27: 397-417.

Loughran, Tim and Jay R. Ritter. 1995. "The New Issues Puzzle." *The Journal of Finance*, L(1): 23-51.

Myers, Stewart C. and Nicholas S. Majluf. 1984. "Corporate Financing and Investment Decisions when firms have information that investors do not have." *Journal of Financial Economics*, 13: 187-221.

Porter, Gary E., Rodney L. Roenfeldt, and Neil W. Sicherman. 1999. "The Value of Open Market Repurchases of Closed-End Fund Shares." *Journal of Business*, 72(2): 257-276.

Sinai, Todd and Joseph Gyourko. 2002. "The Asset Price Incidence of Capital Gains Taxes: Evidence from the Taxpayer Relief Act of 1997 and Publicly-Traded Real Estate Firms." Mimeo. Wharton School, University of Pennsylvania.

Smith, Clifford W. and Ross L. Watts. 1992. "The investment opportunity set and corporate financing, dividend, and compensation policies." *Journal of Financial Economics*, 32:263-92.

Taggert, Robert A. 1977. "A Model of Corporate Financing Decisions." *The Journal of Finance*, 32: 1467-84.

Table I: Summary Statistics

Monthly data on share issuance and returns

	N	Mean	Median	Standard Deviation
DUMMY VARIABLES:				
Announced Share Repurchase Plan (SDC)	5959	0.011	0	0.10
Announced Seasoned Equity Issuance (SDC)	5959	0.028	0	0.17
Monthly % Change in Common Shares > 0	5926	0.24	0	0.43
Monthly % Change in Common Shares > 0.5%	5926	0.12	0	0.33
Monthly % Change in Common Shares < 0	5926	0.046	0	0.21
CONTINUOUS VARIABLES:				
Monthly % Change in Common Shares	5926	0.010	0	0.077
Stock Price/NAV	5958	1.04	1.01	0.19
Monthly Return	5957	0.011	0.0084	0.058

Note: Monthly stock data obtained from CRSP. Net Asset Value (NAV) obtained from Green Street Advisors. The dummy variables take the value of one if the condition holds; for example, the mean of the "announced a repurchase plan" variable implies that 1.1 percent of REIT-month observations included a repurchase announcement.

Table II: Yearly Summary Statistics

Panel A: Repurchases

	Covered by Greenstreet			Not Covered by Greenstreet		
	Number of REITs	Number of REITs that announce a repurchase	Number of repurchases by REITs	Number of REITs	Number of REITs that announce a repurchase	Number of repurchases by REITs
1994	28	3	3	115	2	2
1995	34	2	2	155	7	7
1996	44	3	3	150	4	4
1997	46	3	4	139	7	7
1998	52	12	12	146	23	23
1999	59	23	25	141	34	35
2000	60	9	9	131	19	19
2001	61	6	7	113	4	4
Total	384	61	65	1662	100	101

Panel B: Seasoned Equity

	Covered by Greenstreet			Not Covered by Greenstreet		
	Number of REITs	Number of REITs that announcing an equity offering	Number of equity offerings by REITs	Number of REITs	Number of REITs that announce an equity offering	Number of equity offerings by REITs
1994	28	14	15	115	18	22
1995	34	28	34	155	25	30
1996	44	21	22	150	38	46
1997	46	35	45	139	46	59
1998	52	13	15	146	18	18
1999	59	6	6	141	5	6
2000	60	1	1	131	1	1
2001	61	10	10	113	11	11
Total	384	128	148	1662	162	193

Note: Coverage is computed as of January 1 of that year

Table III: Effect of Lagged Price/NAV on Number of Outstanding Shares

Panel A: Share Repurchases
Probit Regression: Marginal Effects

Part I:

Dependent Variable	Announced Share Repurchase Plan (SDC)			
	(1)	(2)	(3)	(4)
Price/NAV $_{t-1}$	-0.036 (0.006)	-0.027 (0.005)	-0.019 (0.007)	-0.060 (0.025)
Year dummies	No	Yes	No	No
P/NAV Sample	Full	Full	P/NAV $\geq$1	P/NAV<1
N	5959	5623	3181	2778

Part II:

Dependent Variable	Monthly % Change in Common Shares < 0 (CRSP)			
	(1)	(2)	(3)	(4)
Price/NAV $_{t-1}$	-0.14 (0.018)	-0.11 (0.020)	-0.025 (0.020)	-0.23 (0.068)
Year dummies	No	Yes	No	No
P/NAV Sample	Full	Full	P/NAV $\geq$1	P/NAV<1
N	5926	5626	3156	2770

Panel B: Issued New Equity
Probit Regression: Marginal Effects

Dependent Variable	Announced Seasoned Equity Issuance (SDC)			
	(1)	(2)	(3)	(4)
Price/NAV $_{t-1}$	0.085 (0.011)	0.070 (0.014)	0.10 (0.02)	0.057 (0.027)
Year dummies	No	Yes	No	No
P/NAV Sample	Full	Full	P/NAV ≥ 1	P/NAV<1
N	5959	5191	3181	2778

Panel C: Monthly % Change in Number of Common Shares
Ordinary Least Squares

Dependent Variable	Monthly % Change in Common Shares			
	(1)	(2)	(3)	(4)
Price/NAV $_{t-1}$	0.036 (0.009)	0.021 (0.009)	0.025 (0.016)	0.0015 (0.0079)
Year dummies	No	Yes	No	No
P/NAV Sample	Full	Full	P/NAV ≥ 1	P/NAV<1
R^2	0.0084	0.0124	0.0016	0.0000
N	5926	5926	3156	2770

Notes: Standard errors in all regressions are heteroskedasticity robust and allow for correlation within firm. Monthly stock data obtained from CRSP. Net Asset Value (NAV) obtained from Green Street Advisors. Announcement of Share Repurchases and Seasoned Equity Offerings obtained from Securities Data Corporation.

Table IV: Excess returns associated with the announcement of repurchase plan

Dependent Variable	Daily Return				
	(1)	(2)	(3)	(4)	(5)
REITs covered by Greenstreet	No	No	Yes	Yes	Yes
Dummy for 3-day window	0.014 (0.001)	0.013 (0.001)	0.0024 (0.0012)	0.0039 (0.0019)	0.0127 (0.0053)
Dummy for 3-day window* (Percentage of Total Shares Offered for Repurchase)(*100)		0.0012 (0.0003)		-0.019 (0.020)	
Dummy for 3-day window* $(P/NAV)_{t-5}$					-0.0113 (0.0057)
$(P/NAV)_{t-5}$					-0.0027 (0.0004)
p-value: 3-day window coefficients jointly=0		0.001		0.075	0.007
R^2	0.021	0.021	0.030	0.030	0.052
N	92,505	92,505	69,058	69,058	59,694

Notes: Repurchase announcements (events) as reported by Securities Data Corporation for any REIT listed as an equity REIT by NAREIT during our sample period 1994-2001. The first two columns include only equity REITs not covered by Green Street Advisors at the time of the event. The last three columns include all equity REITs covered by Green Street Advisors at the time of the event. The regressions also include event-specific constants and event-specific market betas. The 3-day event window includes one day prior to the event, the event day itself, and the day following the event. The P/NAV coefficient is lagged five trading days prior to the current date. The P/NAV used in the interaction between the event window and P/NAV is the P/NAV five days prior to the event announcement and remains constant throughout the 3-day window.

Table V: Excess returns associated with the announcement of seasoned equity

Dependent Variable	Daily Return				
	(1)	(2)	(3)	(4)	(5)
REITs covered by Greenstreet	No	No	Yes	Yes	Yes
Dummy for 3-day event window	-0.0020 (0.00084)	-0.0030 (0.0011)	-0.0011 (0.00070)	-0.00069 (0.0010)	0.0080 (0.0039)
Dummy for 3-day event window* (Percentage of Total Shares Offered)(*100)		0.00026 (0.00018)		-0.00027 (0.00047)	
Dummy for 3-day event window* $(P/NAV)_{t-5}$					-0.0079 (0.0034)
$(P/NAV)_{t-5}$					-0.0025 (0.0003)
p-value: 3-day event window coefficients jointly=0		0.021		0.23	0.01
R^2	0.0096	0.0096	0.029	0.029	0.042
N	199,945	199,945	124,700	124,700	92,143

Notes: Announcement of a seasoned equity offering (events) as reported by Securities Data Corporation for any REIT listed as an equity REIT by NAREIT during our sample period 1994-2001. The first two columns include only equity REITs not covered by Green Street Advisors at the time of the event. The last three columns include all equity REITs covered by Green Street Advisors at the time of the event. The regressions also include event-specific constants and event-specific market betas. The 3-day event window includes one day prior to the event, the event day itself, and the day following the event. The P/NAV coefficient is lagged five trading days prior to the current date. The P/NAV used in the interaction between the event window and P/NAV is the P/NAV five days prior to the event announcement and remains constant throughout the 3-day window.

Figure 1

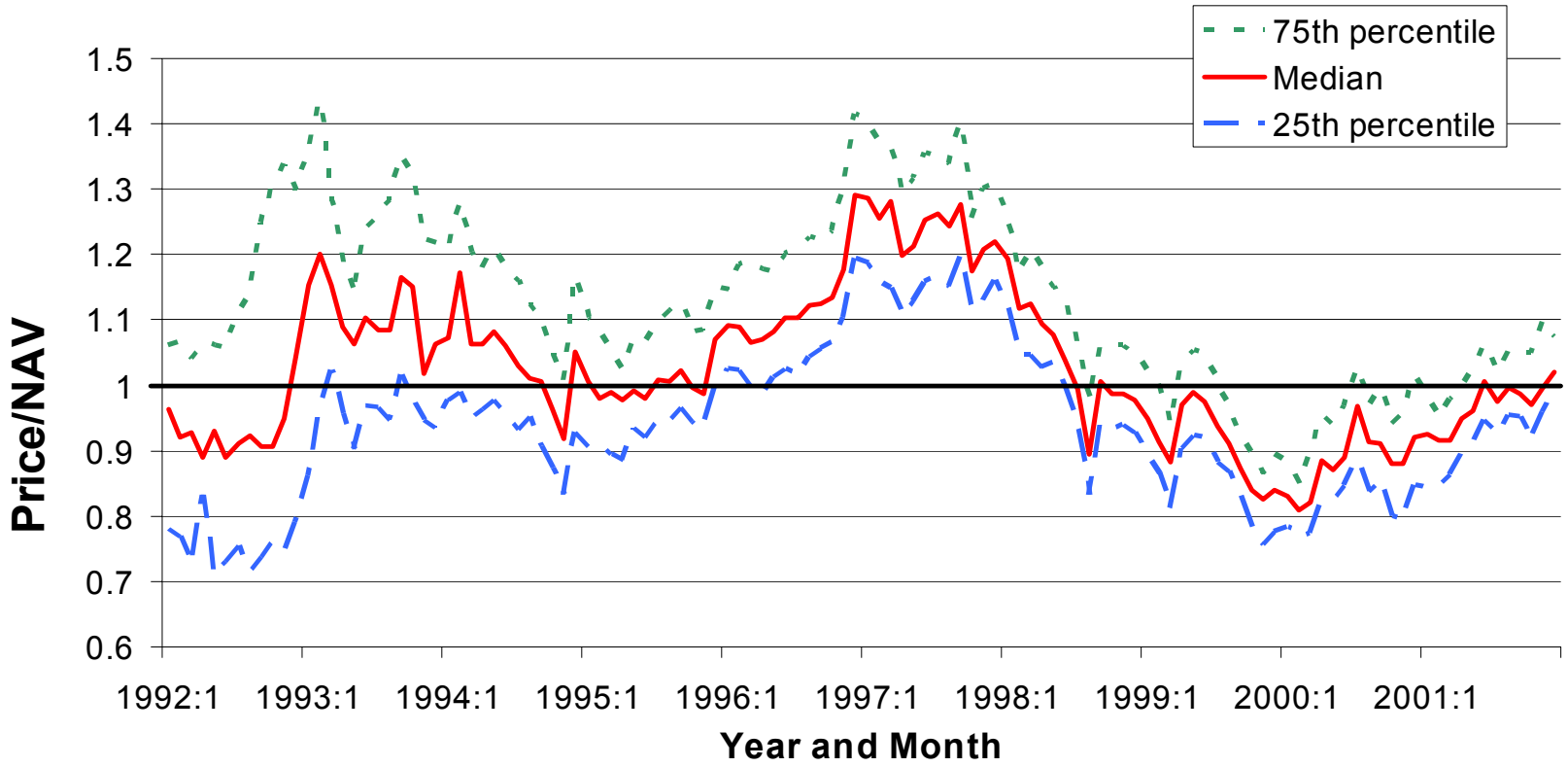

75th percentile
Median
25th percentile
Price/NAV
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
1992:1
1993:1
1994:1
1995:1
1996:1
1997:1
1998:1
1999:1
2000:1
2001:1
Year and Month

Figure 2

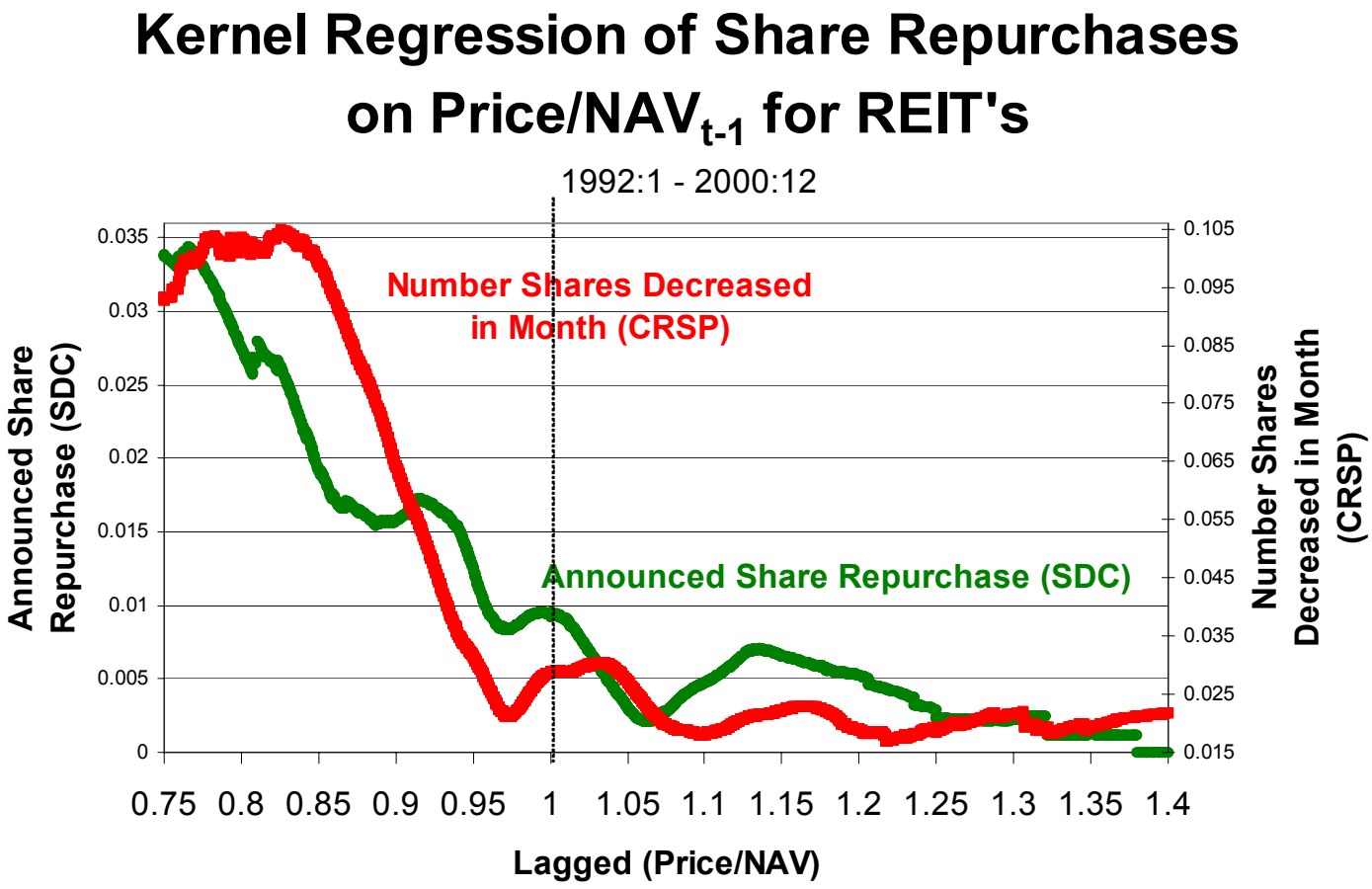

Kernel Regression of Share Repurchases on Price/NAV$_{t-1}$ for REIT's
1992:1 - 2000:12
Number Shares Decreased in Month (CRSP)
Announced Share Repurchase (SDC)
Announced Share Repurchase (SDC)
Number Shares Decreased in Month (CRSP)
Lagged (Price/NAV)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0.105
0.095
0.085
0.075
0.065
0.055
0.045
0.035
0.025
0.015
0.75 0.8 0.85 0.9 0.95 1 1.05 1.1 1.15 1.2 1.25 1.3 1.35 1.4

Figure 3

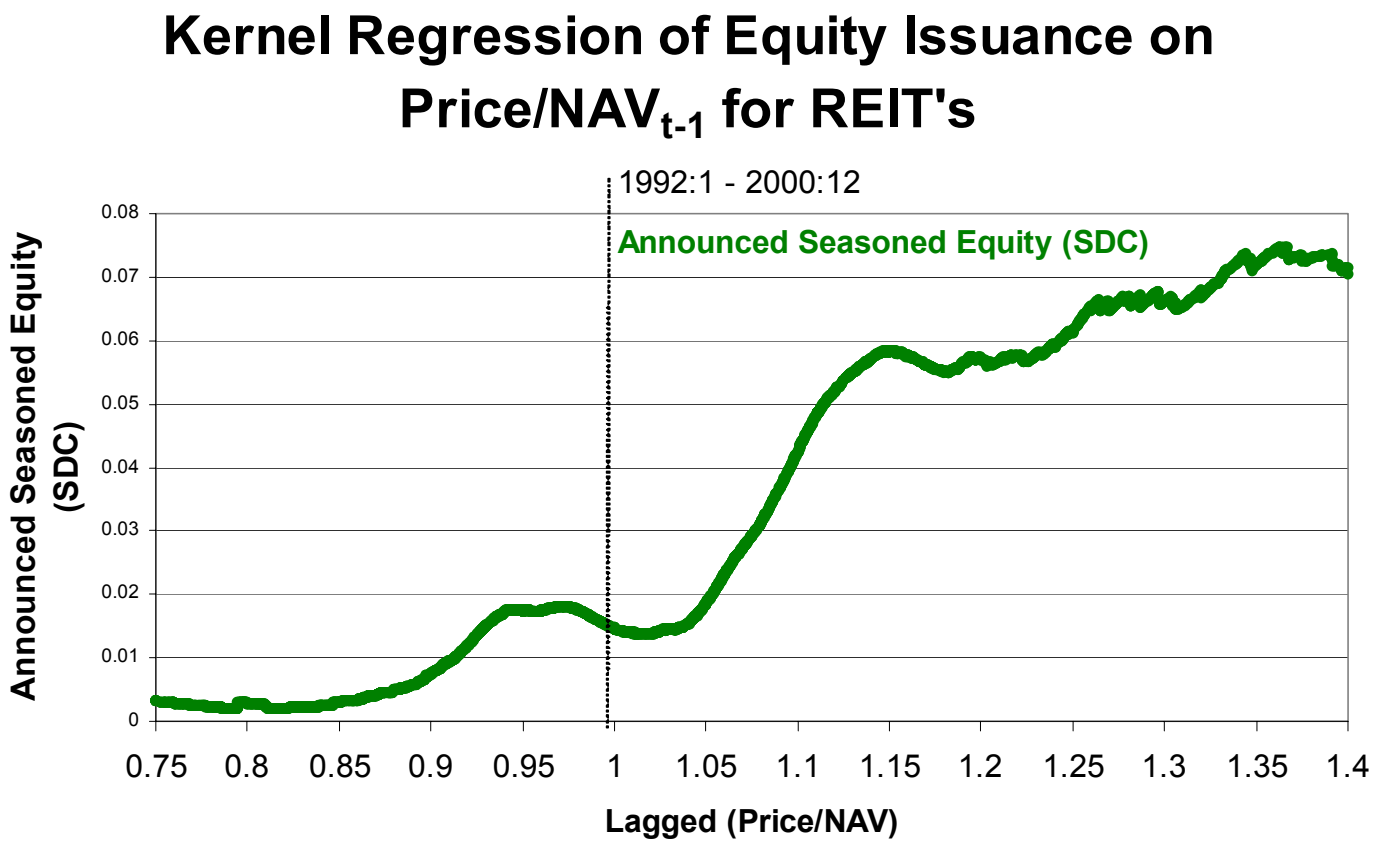
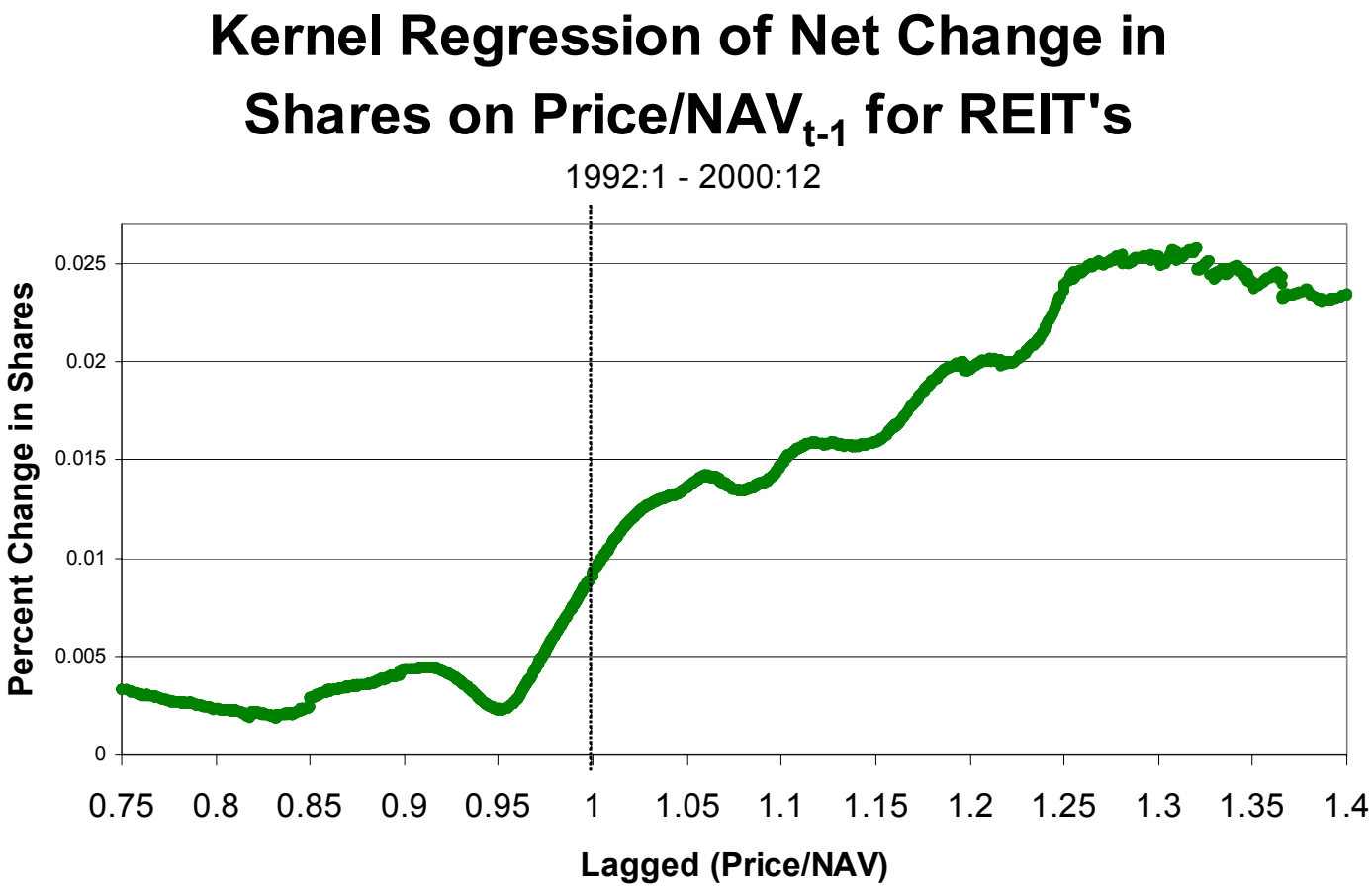

Kernel Regression of Equity Issuance on Price/NAV$_{t-1}$ for REIT's
1992:1 - 2000:12
Announced Seasoned Equity (SDC)
Announced Seasoned Equity (SDC)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0.75
0.8
0.85
0.9
0.95
1
1.05
1.1
1.15
1.2
1.25
1.3
1.35
1.4
Lagged (Price/NAV)

Figure 4


Kernel Regression of Net Change in Shares on Price/NAV$_{t-1}$ for REIT's
1992:1 - 2000:12
Percent Change in Shares
0.025
0.02
0.015
0.01
0.005
0
0.75
0.8
0.85
0.9
0.95
1
1.05
1.1
1.15
1.2
1.25
1.3
1.35
1.4
Lagged (Price/NAV)