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Holding Pattern: A Study of Reit and Real Estate Mutual Fund Performance

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

I examine the relationship between property acquisition/disposition and equity REIT performance. The performance of REITs may determine the level of holdings in real estate mutual funds. I also look into the information content of REIT dividend announcements; does this influence the decision of the real estate mutual fund investment manager to alter their holdings of REITs in the fund? Prior studies document momentum in REIT returns. Given this momentum, I examine whether real estate mutual funds alter their portfolios based on past performance of the REITs held in the fund. Further, I explore whether the changing composition of portfolios causes momentum in REIT returns and leads to momentum in mutual fund returns. Literature has covered the relationship between asset holdings and performance in mutual funds and REITs (McIntosh, Ott and Liang 1995; Chen, Jegadeesh and Wermers 2000; Chui, Titman and Wei 2003 among others). My study combines the process of asset composition of REITs with the REITs' contribution in real estate mutual fund portfolios. I will see if there is any relationship between liquidity of REITs and the change of holdings in the respective portfolios. This will give the investment advisor a look into management of real estate assets in their respective portfolios.

CHAPTER 1
INTRODUCTION

A. REIT Background and the Effect on Holdings

Congress authorized Real Estate Investment Trusts (REITs) in 1960 to provide a means for individuals to make long-term passive, but still liquid, investments in real estate. The 1960 law originally defined a REIT as an unincorporated association with multiple trustees as managers and having transferable shares of beneficial interest.[1] This sets up a REIT to operate similar to a closed-end investment company (closed-end funds, or CEFs). REITs are authorized pass-through entities for tax purposes if they meet the requirements of the Internal Revenue Code (IRC). The requirements are the following:

1) Pay out a minimum of 90% of its taxable income to its shareholders each year;
2) Have at least 100 shareholders with no more of 5 of these holding greater than 50% of the trust's outstanding shares (the '5/50 rule');
3) Be an investor of real estate, as opposed to a broker;
4) Derive at least 90% of its gross income from rent and interest income, gains on the sale of property or shares of other trusts and other real estate sources;
5) Derive a minimum of 75% of its gross income from real property interests, gains on the sale of real property, and shares of other trusts and other real estate sources; and
6) Have at least 75% of total assets in real estate properties (equity REITs) or mortgages, cash and government securities (mortgage REITs).
7) It must be managed by one or more trustees or directors who may be individuals or corporations.
8) It must issue transferable shares.
9) It may not be a financial institution or real estate company.

[1] *Real Estate Investment Trusts,* by Su Han Chan, John Erickson and Ko Wang. Oxford University Press, 2003, page 15.

If the taxable net income (excluding capital gains and certain non-cash taxable items) requirement is satisfied, then the distribution is payable to shareholders in the form of dividends. In this case no taxes are paid at the trust level on the distribution, but only at the shareholder level on the dividends received. A REIT that does not qualify under the IRC as a pass-through entity must pay federal taxes on all taxable income before paying any dividends. The asset and trading restrictions formed by these requirements[2] allowed REITs to become long-term and passive investment vehicles. Properties were not turned over constantly, as with Real Estate Operating Companies (REOCs).

Until recently, REITs were operated and managed by advisors, or firms that served in an advisory capacity. They were compensated by fees based on a percentage of total assets managed. The advisory firms were the original REIT sponsors. McMahan (1994) argues that managers of REIT advisory firms did not have an investment in the REITs under management. Since advisors had no ownership stakes, potential principal-agent problems existed from non-alignment of management and shareholder interests.

Through the exchanges, REITs are the primary vehicle for individuals to own real estate while taking advantage of the higher liquidity and lower transaction costs that trading would offer over selling real estate. Public REITs trade on the underlying value of their income producing real estate (equity), or property financed (mortgage). REITs operate similar to closed-end mutual funds; they invest in real estate instead of securities.

The behavior of real estate and REITs often runs contrary to stock indexes. Returns on the S&P 500 index were 33.4%, 38.6%, 21.0%, -9.1%, -11.9%, and -22.1% from 1997-2002 while REIT returns were 18.9%, -18.8%, -6.5%, 25.9%, 15.5%, and 5.2% over the same period (NAREIT Chartbook, January 2004). This makes real estate an ideal component for diversification in a multi-asset portfolio.

[2] REITs cannot engage in short-term speculative real estate transactions by holding property primarily for sale. The holding period has to be a minimum of four years, with capital expenditures on the property not exceeding twenty percent of the sales price. The REIT cannot sell more than five properties per year, or acquire a property via a foreclosure.

REITs have undergone subtle changes in structure and treatment from 1960 until today. REITs grew in popularity as investment vehicles in the late 1960s. Regulatory restrictions placed on banks, thrifts, and insurance companies from the Glass-Steagall Act of 1933 and the Bank Holding Company Act of 1956 made it difficult for lending in construction and development (C&D) projects. Many of these companies formed REITs to engage in C&D activities. Initially REITs either invested in properties as equity REITs, or mortgages as mortgage REITs. The third type is the hybrid REIT, which invests in property and mortgages. REITs had an average return of 18.58% during the 1960s, with a market capitalization of $711 million by the end of 1969.

In the 1970s REITs went through tough times as the building boom ended. Rising interest rates led to maturity mismatch problems; long-term assets earning low interest rates could not fund short-term liabilities paying high interest rates. Mortgage REITs issued loans to questionable properties due to competition in the industry, and equity REITs had non-performing properties in their portfolios. In addition, REIT advisors were motivated by their fee structure. In an attempt to increase the amount of assets on their books, REITs took on debt (at high interest rates) to fund new projects. Of the two principal REIT types, the equity REITs suffered the least. By limiting the amount of debt financing on conservatively valued projects, some equity REITs maintained a level of profitability.

Tax legislation in 1976 (TRA76) increased the payout to shareholders from 90% to 95%. However the legislation reduced the possibility that the tax-exempt status of a REIT would be removed if the organization unintentionally failed to meet the 75% and 90% gross income requirement. REITs were given the right to hold property for sale, but they were subject to a 100% tax on income produced by the property. This provision was removed if the REIT served as an investor instead of a dealer, or if the REIT held to the four year/five property restrictions. Losses on properties were such that many REITs abandoned their trust status and became corporations so that they could carry forward losses on their books. Sanger, Sirmans and Turnbull (1990) provide evidence that TRA76 and other related tax legislation improved REIT performance while effectively

reducing their risk relative to the overall securities market. REITs that survived the huge losses of 1973 and 1974 (29.62% and 66.89%, respectively) took advantage of lower prices offered by properties held by REITs with C&D loans. Many of these mortgage REITs became equity REITs when they acquired foreclosed properties. REITs had an average return of 12.66%, with a market capitalization of $2.805 billion by the end of the decade.

In the 1980s, REITs had to evolve in order to stay competitive with new real estate entities. Legislation again provided an impact. The Economic Recovery Act of 1981 created new tax breaks for investors of real estate in the form of operating loss pass-through and shortened depreciation periods. Real estate limited partnerships (RELPs) grew in popularity due to this legislation. Firms enjoyed large tax shelter benefits since losses could be passed to investors. RELPs were generally undervalued at purchase, and the short duration of the partnerships produced at worst a break-even investment environment. Master limited partnerships (MLPs) were formed to increase liquidity of partnerships to the point where they challenged REITs. In effect, the MLP creates one large partnership out of many smaller ones.

The Tax Reform Act of 1986 moved many investors with real estate interests into the REIT arena, while greatly reducing the impact of RELPs and MLPs. The main thrust of the legislation (referred to as TRA86) removed the use of passive income losses from partnerships to offset gains in active and/or passive income. This was one of the principal advantages from forming limited partnerships. REITs were also given an additional advantage: the law suspended both the minimum 100 shareholder requirement and the 5/50 rule for a REIT's first taxable year after the beginning of operations. Property not considered real estate for tax purposes received that classification for one year after investment by the REIT. The ability of REITs to be managed internally also increased as a result of this legislation. The reduction of the principal-agent problem allowed for more freedom in making property acquisition/disposition decisions.

REIT performance suffered in the early 1990s due to underperforming properties acquired in the wake of the S&L/thrift failures in the 1980s. Mortgage and hybrid REITs were hardest hit, especially those lending to the overbuilt office, hotel, and condominium markets[3]. The low property values created an opportunity for profits; this led to a significant boom in the equity REIT market in the mid to late 1990s. The number of equity REITs grew from 67 in 1990 to 175 in 1995. The average market capitalization of REITs was $72 million in 1990 and $726 million in 2000. The increase in number of equity REITs during this period was accompanied by a decrease in the number of hybrid/mortgage REITs. The firms suffered from higher volatility and lower returns relative to their equity counterparts. Brown (2000) argues that the weak performance of mortgage REITs during this period results from high leverage combined with the ownership characteristics of the properties on which the REITs were lending led to financial distress during market downturns. Foreclosures on nonperforming loans were rampant, since mortgage REITs had little or no incentive to renegotiate these loans to prevent foreclosure[4].

The creation of the umbrella partnership REIT (referred to as UPREIT) also assisted the equity REIT boom. The UPREIT consists of two entities: a REIT and an operating partnership (OP) that both issue ownership units. The REIT issues shares of stock to the investment public; proceeds from the issues are used to purchase properties and a controlling interest in the OP. With the UPREIT structure, the REIT owns properties indirectly through the OP. The UPREIT structure allows for the securitization of real estate by allowing the operating partners delayed tax assessment until a time when the benefits of the conversion are the greatest. This motivates owners of private real estate to move their properties to an UPREIT. Most new REITs created during this period used the UPREIT structure.

Equity REITs also expanded their sectors of investment. Most REIT investments had occurred in the office sector. Investments in apartment, health care, hospitality, industrial, recreational and self-storage properties increased markedly during this period. Most of the REITs began to operate in a self-advisory capacity with the managers taking

[3] Wang and Zhou (2000) provide a detailed description as to why real estate markets are always overbuilt.
[4] Wang, Young and Zhou (2002) show how lenders do not have an incentive to negotiate with borrowers prior to foreclosure.

a larger equity stake. According to McMahan (1994) the managers arrived with an expertise in these new property types giving the REITs greater potential for profitability.

The REIT Simplification Act of 1997 (referred to as REITSA) and the REIT Modernization Act of 1999 (referred to as RMA) gave REITs more operating flexibility. REITSA eliminated the tax on shareholders who received retained capital gains distributed at a later date and repealed the provision requiring that a REIT not earn more than 30% of its gross income from the sale of assets not held as long term investments. RMA reduced the required distribution of taxable earnings from 95 percent to 90 percent. This presented an opportunity for more aggressive acquisitions because of the increased retained earnings. Howe and Jain (2004) use event study methodology to find a positive wealth effect of RMA on shareholders. The introduction of the Act in April 1999 was the only event to have an effect on abnormal returns. They also find evidence of lower systematic risk in REITs after passage of the Act.

REITs have reaped benefits through increased specialization, changes in structural organization, and stronger attractiveness to institutional investors. They have also become a valid choice for the small investor because of its lower debt levels and higher transparency compared to privately held real estate.

REITs have realized the benefits of size and the increased wealth creation that goes along with it. This has led to increased property and portfolio acquisition along with another form of acquisition, that of mergers. The following advantages can be gained from merger activity:

1) increased operating efficiency and higher flow of funds from operations
2) economies of scale leading to a lower cost of capital
3) greater access to capital leading to higher analyst coverage
4) increased share liquidity, creating greater institutional investment

I study REIT property acquisitions/dispositions and dividend announcements from 1994-2003 and test for evidence of abnormal returns in REITs around the respective announcements. Acquisitions and dispositions are analyzed separately to determine which type of property transaction has the greatest effect on abnormal returns. There has not been much work on the effects of these events during this time period. In addition,

three distinct trends occur during these years: the REIT IPO boom of 1996 to 1998, the 1999 to 2000 internet bubble period, and the collapse of the bubble from 2001. I will determine the effects of announcements on abnormal returns during these sub-periods. The effect of the announcement of property transactions on abnormal returns should be robust across the sub-periods. The abnormal returns results and changes in holdings result will offer insight on the efficiency of the market.

B. Mutual Funds

Mutual funds were formed in 1924, operating as regulated investment companies. They offer investors an opportunity to hold a portfolio of stocks that have a large degree of diversification and a lower level of transactions costs. Similar to REITs, the share price of the mutual fund is determined by the value of the underlying assets. Mutual funds are also exempt from taxes through distribution of the income earned by the investment company from capital gains earned from the sale of their underlying holdings and dividend payouts of those holdings. The distributions are passed on to the investors of the mutual funds.

Mutual funds are managed by individuals whose responsibility is to form a portfolio according to a particular investment objective, referred to as fund style. Performance of funds is generally measured by changes in Net Asset Value per share (NAV), which is measured by the underlying value of the portfolio. As a financial intermediary that benefits small savers, each fund is an assemblage of debt, equity and long-term/short-term instruments, depending on the objective of the fund. Some of the more popular fund styles are growth, growth and income, income, asset allocation, bond, and balanced. Fund styles cater to the entire spectrum of risk aversion.

Wermers (2000) determines that mutual fund returns that beat benchmarks are attributed to stock characteristics and manager skill with the respective contributions about equal. When net returns are evaluated, the author finds underperformance of the funds compared to benchmarks. Underperformance is due to performance of non-stock

holdings and transaction costs/expenses, with 70% of underperformance assigned to the latter. As a result, returns from stocks almost cover transaction costs and expenses, and non-stock holdings falling short of market returns.

Bollen and Busse (2001) examine the ability of mutual fund managers to time the market by exposing their portfolios prior to positive market conditions and removing them prior to negative market conditions. The authors compare daily and monthly returns of 230 mutual funds from 1985 to 1995. They used simulated fund returns to control for spurious results and test for market timing. The authors find evidence of market timing in daily returns, but not with monthly returns. Chan, Chen, and Lakonishok (2002) determine the relationship between types of mutual funds (fund objective) and the investment style of the fund manager. They use monthly fund returns and regress them on the Fama and French (1993) three-factor model. The authors use return data from 1976 to 1997, and use various fund style tests. The authors model for investment style by looking at the characteristics of the fund. They perform time series regressions using returns from growth and income, growth, income, value, and glamour funds. As an additional measure, they compare return error volatility between the fund and the respective style index. Finally, returns according to investment styles are measured over factors such as market, size, and value. They argue that when fund styles stray far enough from a broad index, growth stocks and funds with good past performance were preferred. In addition, the timing ability of managers is limited.

Pinnuck (2003) investigates the performance of mutual fund holdings across fund managers. He uses a dataset of Australian mutual funds and determines that stocks purchased by fund managers exhibit abnormal returns and stocks sold show no evidence of abnormal returns. Fund managers have a greater probability of possessing superior information with large stocks in the portfolio than small stocks. This advantage does not pass down to the individual fund investor.

Certain mutual fund styles are that of ‘specialty’ funds, which concentrate their holdings in a particular industry. Of particular interest are real estate mutual funds,

whose holdings consist of Real Estate Investment Trusts (REITs) and Real Estate Operating Companies (REOCs). I will focus attention on REITs.

Gallo, Lockwood, and Rutherford (2000) look at the performance of real estate mutual funds from 1991-1997. They find that funds that had at least 15 months of returns and had a single load class[5] have a 5.3% positive return relative to the Wilshire Real Estate Index. In addition, they provide controls for small-cap REITs and health care REITs, generally not included in the Wilshire index. They find a 1% return contribution from health-care REITs. The authors perform analysis across property types and find a significant allocation and performance with apartments. They conclude that fund allocations across property types add value to the real estate mutual fund portfolio.

Kallberg, Liu, and Trzcinka (2000) look at the performance of 68 REIT mutual funds from January 1987 to June 1998. They measure the risk premium with a single factor (excess return on a REIT index or the S&P 500 index) model, multi-factor (excess return on index, small-cap minus large cap, growth minus value, and excess return on bond portfolio) model, and a multi-factor model that includes varying real estate indices. Regressions yield positive intercepts where previous general mutual fund studies record negative intercepts. This suggests behavior of real estate mutual funds contrary to mainstream mutual funds. The authors test for persistence of performance by forming five equal-weighted portfolios based on one-year lagged returns, rebalancing the portfolios after a six month holding period. They find no significant evidence of persistent excess returns using the multi-factor model. They find evidence of persistence only in the highest quintile using the single factor model. Based on turnover, actively managed funds have higher intercepts than passively managed funds.

Fund managers, in their desire to maximize the value of their funds, adjust their holdings periodically. If a security is performing well, then the manager would consider increasing his holding in that particular security. In turn, if the security continued to

[5] Multi-class shares differ in fees and/or sales loads. Class A shares require a front end load; Class B shares defer sales charges (back-end load); and Class C shares have no load. Multi-class shares hold the same portfolios for all classes.

perform well the NAV would increase. A poor performing asset could lead to a decrease in stock holdings. The NAV could decrease due to the underlying value of the poor performing asset. However increasing or decreasing holdings alone does not change NAV. NAV changes positively if the security that is added to the portfolio continues to do well. Poorly performing securities whose holdings are decreased will lead to a larger change in NAV than if their holdings were not decreased; the stronger securities will replace the weaker ones in the portfolio. This trading could also serve as a positive signal; the market can perceive this as a move to a better portfolio. This would be consistent with Jegadeesh and Titman (1993) where winners are bought and losers are sold, generating positive returns over 3 month to 12 month holding periods.

Chen, Jegadeesh, and Wermers (2000) examine trades and holdings by mutual fund managers. They find that stocks actively purchased by the funds outperform those actively sold. This advantage only exists during the first year following the trades, indicating a short-lived information advantage. They also argue that persistence in the funds is due to the momentum effect instead of superior stock picking skills. Baker, Litov, Wachter and Wurgler (2004) (hereafter referred to as BLWW) look at the holdings in mutual funds. The authors look at event study alphas and use them as a measurement of stock picking skill. They study the performance of the underlying assets by measuring abnormal returns of the stocks around the earnings announcements subsequent to the change in asset holdings. They find that, on average, stocks that fund managers buy earn significantly higher returns at subsequent earnings announcements than stocks that the fund managers sell. Funds also display persistence, and those that do well tend to have a growth objective, large size, high turnover, and use incentive fees to motivate managers.

Chui, Titman, and Wei (2003) examine if a momentum trading strategy can be used in the REIT market. They find the strategy generates a profit of 0.76% per month for publicly traded REITs from 1982-1997. Monthly returns from common stock are 0.61% over the same period. They argue that the superior performance and more pronounced momentum effect are due to the relative illiquidity and smaller size of REIT stocks to common stocks. However, during the period prior to 1990 the authors find a

very weak momentum effect. They attribute the difference to increased valuation uncertainty of REITs. The uncertainty could be caused by revised organizational and ownership structure[6].

The ability to predict future security performance based on past performance has always been a popular topic in finance literature. Return persistence and momentum in stocks has received much attention. Chordia and Shiakumar (2002) determine that certain macroeconomic variables (term spread and yield spread) along with business cycles contribute strongly to the predictive ability of past returns. Jegadeesh and Titman (1993) establish short-term momentum patterns (three to twelve months). Studies by Lee and Swaminathan (2000), Jegadeesh and Titman (2001), and Cooper et al (2004) find return persistence is more prevalent among winners during the first year after portfolio formation; the relationship reverses over the subsequent four years. Cooper et al (2004) also conclude that macroeconomic variables do not contribute to momentum profits. In a contradictory view, Lesmond et al (2004) argue that large momentum profits are generated by stocks with high transaction costs, thereby producing the illusion of profits.

Return persistence and momentum in mutual funds, and its relation to fund performance, has received much attention in the last ten years. Hendricks, Patel, and Zeckhauser (1993) study persistence of mutual funds in the short term, finding evidence of persistence over the first four quarters and reversion over the next four quarters. Funds that perform well over the prior year continue to perform well the subsequent year. Poor performers exhibit an even stronger persistence effect. Volkman and Wohar (1995) find persistence in superior performing funds with a maximum capital gains objective and low management fees ($\leq$ 0.50%). Falkenstein (1996) argues that mutual fund holdings are dependent on characteristics of the stocks in the fund. Price, volatility, age, information content (via news stories), and size contribute to the choice and amount of security in a fund. He finds that managers exhibit trend chasing or herd behavior; they look to add

[6] REITs in earlier years were small in relation to common stocks; their average market capitalization was $386 million. They were run by advisors that generally had no equity stake in the company. Today, most REITs have internal management responsibilities, and are involved with land acquisition, development, and property management, along with acquisition of income producing properties.

positive performing funds to their portfolio and remove poor performers. Blake, Elton, and Gruber (1996) find evidence of short-run and long-run persistence when they use risk-adjusted returns to rank funds.

The finding of momentum patterns in REITs raises interesting questions concerning REIT mutual funds that are addressed in this study. First, I examine REIT returns over a recent period and compare their returns with various benchmarks. Next, I investigate whether momentum in REIT returns causes REIT mutual funds to alter their holdings based on prior REIT returns. If momentum in REIT returns exists, and REIT mutual funds alter REIT holdings in response, then there should be REIT mutual fund return persistence. This is the third issue that I explore.

I analyze the effects of REIT performance on the holdings and performance of the real estate mutual fund portfolios. A fund manager may use performance information as a basis for adjusting holdings. If persistence in REITs exists, then the manager would acquire more winners and discard losers. The resulting adjustment would add to the value of the portfolio. I look at the REITs that are part of the mutual fund and determine their returns over quarterly periods. I next determine if a relationship exists between these returns and subsequent changes in REIT holdings by the mutual fund. If, based on momentum patterns, increased holdings of past winners leads to a subsequent increase in NAV, this will translate into improved mutual fund return performance. Improved performance contributes to the rating of the fund, the reputation of the fund manager, and the wealth level of the investor. I investigate if persistence of returns in REITs will lead to increased holdings, which will lead to persistence in the REIT mutual fund performance.

I examine the performance of the real estate mutual funds and compare them to certain market and asset benchmarks. The mutual fund returns cover a period from 1994-2003, a ten year block of time that incorporates more mutual funds than the study by Gallo et al (2000). They argue that superior performance is due to fund managers placing more weight on sector-specific REITs (apartment and health care). This result implies

that a manager would add value to his portfolio by increasing holdings in apartment or health care REITs. The number of health care and apartment REITs has increased substantially and I examine more recent data beginning in 1997 (this is where the updated analysis begins) to see if the same conclusions hold with more recent data.

In this area the dissertation contributes to the literature in two ways. First, real estate mutual fund performance may be tied to fund holdings and momentum in similar fashion to traditional mutual funds. Persistence in the firms that make up the fund, along with subsequent return persistence of the fund, has not been studied. Second, real estate mutual fund performance during and after the internet bubble has not been studied. I provide such an analysis. In so doing, by focusing on REITs and real estate mutual funds I will provide more complete evidence on the behavior of mutual fund returns and the possible unique role of the real estate sector.

I will investigate the performance of real estate mutual funds by determining any momentum relationship with the underlying assets (REITs). Is the level of holdings in the underlying assets affected by REIT performance? I will see if there is any relationship between REIT liquidity and its effect on the manager's decision to alter REIT holdings in the respective mutual find portfolios. This can tell us whether or not managers chase liquidity like they chase earnings.

In summary, this dissertation will establish the following:

1) the effect of announcements that impact the wealth effects of REITs (property acquisitions and dispositions). Abnormal returns should exist in a window around the announcements. This will help explain the behavior of REIT holdings, i.e. the underlying assets.

2) the effect of REIT dividend distribution policy on REITs.

3) if REIT liquidity is a determinant in the real estate mutual fund manager's decision to alter holdings.

4) evidence of momentum in REITs, and how it affects the decision of a mutual fund manager to change the percentage holdings of REITs in the fund portfolio. As the

weights of the underlying assets change, there should be evidence of momentum in the real estate mutual fund.

The rest of the dissertation proceeds as follows. Chapter 2 offers review of the literature on REIT acquisitions and dispositions, REIT performance, mutual fund momentum and persistence. Chapter 3 covers the source of data along with the methodology and models for empirical testing. Chapter 4 provides the empirical results. Chapter 5 concludes the dissertation.

CHAPTER 2
A REVIEW OF THE LITERATURE

This chapter will look at literature covering the wealth effects of REITs around acquisitions and dispositions. As a REIT acquires or sells property, the efficiency of the market around the announcement is tested. Various measures of REIT performance are used to determine the effects of announcements. Also, dividend distribution announcements (positive or negative changes in dividend payout) are studied to determine their effects on REIT prices. I review the behavior of mutual funds and the ability to predict returns. Real estate mutual funds with REITs as the underlying assets are studied to see if similar patterns of performance exist.

A. REIT Wealth Effects, Announcements, and Returns

A.1 Acquisitions and Dispositions

There has been considerable literature covering the wealth effects of REITs around acquisitions and dispositions. Elayan and Young (1994) find target companies earn excess returns around acquisition announcements. The returns exist after both full and partial acquisitions. In addition, larger excess returns exist after control acquisitions. McIntosh, Ott and Liang (1995) find no evidence of wealth effects to shareholders after acquisition or sale announcements. The source of funding acquisitions can affect wealth gain. Pierzak (2001) argues that using cash for acquisitions implies shareholders expect larger returns than with OPs or a mixed source of funds (stock and cash).

Sources of information unique to REITs are available for investors to make acquisition and disposition decisions. Ghosh, Guttery and Sirmans (1998) determine that investors react negatively to poor performing real estate assets held by financial institutions. The negative reaction of investors is reflected by the infrequency of REIT trading.

A.2 Liquidity

The decision of a real estate mutual fund manager to alter the holdings of REITs in their portfolio can be influenced by the liquidity of the REIT. Liquidity is defined as the ease an asset can be converted to cash with minimal cost to convert the asset and minimal loss of value to the asset. Liquidity and its effect on asset prices is generally measured by the bid-ask spread, turnover and trading volume. An inverse relationship exists between bid-ask spread and asset liquidity. A direct relationship occurs between turnover and liquidity. Clayton and MacKinnon (2000) argue that traders are more informed, leading to increased trading.

Liquidity issues of publicly traded REITs are covered by examining the bid-ask spread. Danielsen and Harrison (2000) determine that REITs trading on the NYSE are more liquid than REITs trading on NASDAQ. Not only do NYSE REITs exhibit higher turnover, they also show higher trading volume. They argue that the larger spreads found in NASDAQ REITs are due to higher transaction costs and differing asset composition than their NYSE counterparts. Clayton and MacKinnon (1999) find that with equity REITs increased spreads coincide with the REIT market downturn of 1997-1998; there is an increased volatility of REIT prices and a decrease in trading volume. Below, Keily and McIntosh (1996) find significant reductions in bid-ask spreads during 1992 and 1994. The difference in spreads between REITs and non-REITs fell by one-half during these periods, leading to reduced transaction costs and improved liquidity for investors. I study liquidity issues with REIT performance and determine if this has a role in a real estate mutual fund manager's decision to alter REIT holdings in the fund.

A.3 Dividends

Earlier research looks at basic reasons why firms issue dividends. Aharony and Swary (1980) argue that dividend announcements serve as a market signal, conveying asymmetric information about the firm's future earnings. This view is supported by Healy and Palepu (1989). Wansley, Sirmans, Shilling and Lee (1991) find that dividend announcements are not related to the predictability of earnings or the percentage change

in earnings. The authors argue that dividend policy itself sends a signal to the market. Jensen (1986) looks at dividend policy from a principal-agent point of view. If a firm has excess free cash flow, an increase in dividend payments would signal an increase in firm value. Managers would use the excess cash flow as an incentive to increase their compensation by investment in negative NPV projects. Shareholders on the other hand would prefer the excess cash flow in their hands as dividends. Lang and Litzenberger (1989) also find evidence of agency problems in their study.

Shilling, Sirmans and Wansley (1986) study the information content of REIT dividend announcements. Specifically, the authors look at the effect of changes in dividend policy on REIT stock returns. They determine that with an unstable dividend payout policy (variable dividend payouts) information content exists when the dividend announcement occurs before or after the earnings announcement. With a stable dividend payout policy, information content exists if the dividend announcement occurs before the earnings announcement, but not after the earnings announcement. If the dividend payout policy was restricted by tax regulations, then there was no evidence of information content.

Since REITs are bound by regulation to have a dividend payout policy[7], the announcement of a dividend should have little effect on price. However, REITs can exceed the regulated payout. According to Kallberg, Liu and Srinivasan (2003) REITs have a median dividend payout that is 111% of gross income. McDonald, Nixon and Slawson (2000) determine that dividend announcements provide information for equity REITs and smaller size REITs, but no information significance for larger size REITs. The effect of asymmetric information is more prominent around FFO announcements than other announcements of performance. This suggests that investors process FFO announcements differently than other information. Any problems created from adverse selection are more than offset by the amount of uninformed traders. This dissertation looks at the effects of dividend announcements on REIT performance. I will determine if

[7] Initially 90% of REIT proceeds are distributed to shareholders. This amount increased to 95% after TRA76, then reduced to 90% after the 1999 REIT Modernization Act.

dividend information affects the same REIT size classes mentioned in the McDonald, Nixon and Slawson (2000) study. The effects of dividend announcements on REIT performance should have an influence on the mutual fund manager's decision to add, remove, or change the amount of a REIT in the real estate mutual fund portfolio. This relationship has not been covered much in the literature. This dissertation intends to fill that gap by examining the effect of changes in dividend policy on REIT stock returns. I will look at the information effects of dividend announcements before and after the earnings announcement. Results obtained will either confirm or refute the conclusions argued in the Shilling, Sirmans and Wansley (1986) study.

A.4 REIT Returns

The REIT investor and real estate mutual fund investment advisor's decision-making process is primarily motivated by REIT performance. Chen and Peiser (1999) determine that newly formed REITs perform better than more established ones. In addition, REITs do not generate the level of returns produced by either the S&P 500 or the S&P Mid-Cap 400.

Performance measures can be used to detect patterns in returns, allowing the investor to see if there is predictability in returns. Ling, Naranjo and Ryngaert (2000) use a sample of REITs and compare them with the S&P 500 index and Ibbotson data. They find that excess returns are far less predictable out of sample than in sample, especially during the 1990s. Similar conclusions are established by Ling, Naranjo and Nimalendran (2000). They compare equity REIT returns to other asset classes. Friday and Peterson (1997) argue that tax-loss selling strategies create a January seasonal effect for REITs across all sizes and classifications. Median home prices from the National Association of Realtors (NAR) database are compared to REIT returns. Graff and Young (1997) look at monthly, quarterly and annual REIT returns. The authors determine that monthly and annual returns show persistence while quarterly returns do not. In addition the flow of funds in and out of larger REITs has a negative effect on returns. Clayton and MacKinnon (2001) find a significant relationship between equity REIT returns and bonds, small capitalization stocks, and large capitalization stocks. This relationship

weakens over time. Large capitalization stocks account for the greatest proportion of REIT market volatility but the relationship is not as strong in time series. A time series relationship is also studied by Nelling and Gyourko (1998). The authors compare the predictability of REIT monthly returns with the returns of small and mid-capitalization companies. They find returns are predictable based on past performance, but transaction costs wipe out all effects of returns. This dissertation searches for evidence of persistence in the returns of REITs and real estate mutual funds. The aforementioned studies contain information that will be a basis for this study. Persistence of REITs has been studied, but the contribution of persistence to the manager's decision to alter holdings in the real estate mutual fund has not been studied. This dissertation offers a new look at persistence and change in real estate mutual fund holdings.

Determination of risk and volatility of REIT returns can assist in investment choice and possible diversification benefits. Many studies have been made to investigate whether REIT volatility mimics the stock or bond market. Litt, Mei and the Paine Webber Team (1999) use a risk-adjusted model and find mean returns of high risk and low risk REITs are greater than T-bills. The authors argue that approximately 34% of REIT excess returns are explained by systematic risk. In addition, REIT size has a significant negative correlation with firm specific risk. High FFO payout firms have lower systematic risk. Nelling and Gyourko (1998) examine systematic risk and diversification properties of publicly traded REITs. They find variation in risk by type of property held. They don't find evidence of REIT diversification across property types or geographic region.

Risk in REITs is often measured by the firm's variance or beta. Chandrashekaran (1999) uses a constructed REIT index and finds a decline in variance and covariance with other asset classes after an increase in the index; the index decreases as the variance and covariance with other asset classes increases. Chatrath, Liang and McIntosh (2000) discover asymmetric betas across advancing and declining markets. This behavior is consistent with small capitalization stocks. Conover, Friday and Howton (2000) perform time-series and cross-sectional studies using equal-weighted REIT returns and find no significant relationship between equity REIT returns and a constant beta. They find when beta is allowed to vary over time periods (bull market and bear market along with

January and non-January months) there is a significant relationship between beta and returns during bull market months, January and non-January months. The effects of announcements on REIT performance can be controlled for risk by using volatility measures, risk or liquidity.

B. Mutual Fund Performance and Momentum

Mutual funds were formed in 1924, operating as regulated investment companies. They offer investors an opportunity to hold a portfolio of stocks that have a large degree of diversification and a lower level of transactions costs. Similar to REITs, the share price of the open-end mutual fund is determined by the value of the underlying assets. Unlike REITs, the purchase and sale of shares only occur at the end of the trading day. Mutual funds are also exempt from taxes through distribution of the income earned by the investment company from capital gains earned from the sale of their underlying holdings and dividend payouts of those holdings. The distributions are passed on to the investors of the mutual funds. Since the 1980's, mutual funds as an investment vehicle have grown markedly due to the increased use of retirement accounts such as the 401(k) and Individual Retirement Account (IRA). The mutual fund companies purchase and sell off securities to establish a net asset value (NAV) for the fund. The NAV establishes the price to trade.

The pattern of holdings in mutual funds can be implied by the frequency in which shares of a fund are traded. O'Neal (2004) looks at the patterns of mutual fund investors as they adjust their portfolio mix by buying and selling shares of a mutual fund. The author looks at patterns of purchase and redemption of fund flows separately, which is different from the net fund flow studies that appear in the literature[8]. Mutual funds from 1995 to 2000 are used. He finds an expected pattern of higher redemption rates (dollar redemptions divided by average dollar net assets) in poorly performing funds. The author also investigates how purchases and redemptions of funds are affected by the class of the

[8] Ippolito (1992), Chevalier and Ellison (1997), Goetzmann and Peles (1997), and Sirri and Tufano (1998) use net fund flows to identify a relationship between prior period performance and present fund flows. They find that previous positive performance was rewarded by increased fund flows while negative performance was not penalized to the same extent. Gruber (1996) and Zheng (1999) determine that on a risk-adjusted basis net fund flows determine that new investment outperforms existing investment.

fund (load or no-load). The author concludes that the use of a broker (load funds) can be justified by higher purchase and redemption rates. This dissertation will look into real estate mutual fund holdings from a fund flow, purchase and redemption rate perspective. The holdings (REITs) in real estate mutual funds have a different level of liquidity than the holdings (stock) of mainstream mutual funds. The relationship of fund flows and holdings in this sector of mutual funds is an untapped area of research that will be explored by this dissertation.

Grinblatt and Titman (1989) use quarterly holdings data of mutual funds from 1975 to 1984 to determine if managers exhibit skill in picking stocks for their respective mutual funds. Jensen's alpha is the performance measure the author's use for the study. They find evidence of a positive alpha from their tests, suggesting that managers could have superior stock picking ability. The effects disappear when transaction costs are included.

Gibson, Safieddine and Titman (2000) look at how mutual fund holdings can be affected by policy changes. The Tax Reform Act of 1986 (TRA 86) legislated a year end reporting date of October 31 for all mutual funds The authors investigate the effects of tax-loss selling on holdings. The authors found evidence of reduction in holdings prior to October 31, revealing a November effect.

The level of stock holdings by mutual funds can be affected by the decision of a firm in general to issue dividends or declare a stock split. Grinstein and Michaely (2005) determine that institutions have increased holdings in firms that pay out dividends. Of firms that distribute dividends, institutions preferred low payout firms for their respective portfolios. Higher concentration of holdings did not cause firms to increase their dividend payouts. Rozeff (1998) studies the effects of mutual fund stock split and stock dividend announcements. He finds that similar to common stock splits, high returns occur for a short period prior to the split announcement. The level of holding increases after the fund split. Fernando, Krishnamurthy and Spindt (1999) study quarterly holdings of mutual funds from 1978 to 1993. The authors conclude that mutual fund splits attract increased fund inflows by investors, but does not significantly alter the level of holdings within the fund.

A fund manager's decision to alter holdings of a stock in the mutual fund is motivated by both the performance of the individual underlying assets and the previous performance of the fund. There have been questions on the ability of a mutual fund manager to successfully time the market. Studies exist showing no evidence of mutual fund market timing using monthly fund returns. Busse (1999) and Bollen and Busse (2001) use daily return data (obtained and simulated) and find evidence of timing with fund returns and fund volatility. Since this dissertation looks at returns on a quarterly basis, timing the market with mutual funds is unrealistic.

Instead of timing the market, maybe the fund manager simply has a level of skill that allows them to successfully select stocks. Dellva, DeMaskey and Smith (2001) investigate whether the ability to select or time the market with the underlying assets is prevalent with sector funds. Sector funds are mutual funds where the underlying assets are all in the same industry. Real estate mutual funds are a type of sector fund. The authors look at the Fidelity Select Mutual Fund and analyze 35 different sector funds. The authors use models to test for selectivity and market timing. They determine when benchmarks that are more closely related to a particular sector are used the sector fund shows some evidence of selectivity; that is the manager has an ability to successfully select stocks. The models used by the authors show that when a manager tries to time the market they obtain negative results. Of the various industries studied by the authors, the real estate sector was excluded. I will study the real estate sector using the authors' approach. This particular sector has not been studied.

Grinblatt and Titman (1993) look at the relationship between mutual funds and their respective holdings. They found evidence of abnormal performance of funds studied from 1976 to 1985. By using quarterly holdings information, they concluded that no benchmark was needed to predict abnormal performance. Quarterly holdings information in this dissertation will be analyzed with and without benchmarks.

Badrinath and Wahal (2002) investigate the effects of quarterly holdings by all institutions (banks, insurance companies, pension funds and mutual funds) and whether or not institutions are momentum traders. Their analysis of changes in holdings takes into account stocks that are introduced (denoted entry) and/or removed (denoted exit)

from the institution's portfolio. They find that institutional investors act as momentum traders when stocks are brought into the portfolio. Institutions act as contrarian traders when stocks are removed from portfolios or the weights of existing stocks within the portfolio change. In the case of mutual funds, they find a greater sensitivity to changes in portfolio holdings than their institutional counterparts. The authors find the majority of entry and exit activity exists with small stocks. In the case of real estate mutual funds, the REITs which comprise the holdings are predominately small capitalization securities. Since the range of market capitalization of REITs is not large compared with stocks in the typical mutual fund portfolio, the effects of entry and exit on changes in holdings would be minimized. This dissertation will look at effects of changes in holdings overall in real estate mutual funds. The restrictive nature of the assets in this sector of mutual funds should offer different patterns of behavior from the typical mutual fund studies.

Carhart et al (2002) look at survivor bias when determining persistence in mutual fund returns. The authors develop a methodology that identifies periods where a fund has to be active for inclusion in their study. They find a negative relationship between the length of the fund period and the effect of persistence on fund returns.

Griffin, Harris and Topaloglu (2003) look for evidence of momentum trading by institutions and individuals. The authors evaluate daily returns. They find a strong relationship between changes in institutional portfolio holdings and daily stock returns. Net trading by institutions is largest amongst stocks with strong returns. At the same time, individual traders sold the same group of stocks. They also find that trading by institutions follow prior returns. Connolly and Stivers (2003) investigate patterns between returns and trading volume. The authors find momentum (reversals) in stock returns over consecutive weeks when the latter week's returns have abnormally high (low) turnover. A similar momentum relationship is found when return dispersion is measured. The strong first order correlation in weekly returns supports their findings. This dissertation studies momentum of REITs held by the mutual funds. The momentum effects are evaluated by quarterly returns, so it is unlikely the first order autocorrelation effects will be as strong. Lynch and Musto (2003) report evidence of increased fund flows for the strong performing funds.

Sias (2004) determines the probability of and explanation for institutional herding. The author investigates if momentum trading of institutions is an explanatory factor in herding. He finds institutional investors follow themselves or others when making decisions to alter the level of holdings in a portfolio (herding). Of all the different investor types (banks, insurance companies, mutual funds, pension funds) mutual funds are least likely to exhibit herding behavior. Momentum in underlying assets is not the significant reason for herding by individual investors in their portfolios.

This dissertation looks at the effects of REIT performance and changes in real estate mutual fund holdings. The standard measure of performance is returns, defined as a percentage change in stock price from the prior period. I also look at other measures of REIT performance, earnings per share (EPS) and funds from operations (FFO). Vincent (1999) examines the use of funds from operations (FFO) as opposed to earnings per share (EPS) and returns as a measure of REIT performance. FFO is determined by taking a REIT's net income as determined by GAAP (excluding net acquisition and disposition of assets) and adding back real estate depreciation[9]. The author looks at the information content of FFO and compares it to other information measures such as EPS, cash from operations and earnings before interest, taxes, depreciation and amortization. The author uses stock returns as a benchmark and determines that FFO has more information content than the more standard summary measures. This conclusion supports the use of FFO by NAREIT as the preferred measure of REIT performance. Performance measures used in this dissertation will look at percentage changes in REIT price, EPS and FFO from the prior period.

The literature has covered information effects of announcements and their relationship to performance. In addition, numerous momentum studies have been done based on returns. Chui, Titman and Wei (2003), among others, have found evidence of momentum in REIT returns.

There have been momentum studies based on earnings, particularly Chan, Jegadeesh and Lakonishok (1996). Different earnings momentum strategies are analyzed

[9] NAREIT Website, Glossary of Terms (2005).

on a common set of data. The authors create the following earnings news variables[10]: SUE, ABR and REV6. The authors compare these variables to a momentum variable denoted R6. This will determine if the earnings momentum effect is stronger than the price momentum effect. The authors determine the price momentum effect is stronger than the earnings momentum effect.

REIT performance should motivate real estate mutual fund managers to alter their holdings. There has been no literature on the presence of momentum in REIT returns, and how momentum can influence the percentage of holdings in a real estate mutual fund. This dissertation tests for evidence of performance persistence in REITs and how a manager uses momentum in REITs to motivate decisions to alter real estate mutual fund holdings. The dissertation measures performance of REITs based on stock returns, EPS and FFO. The relationship between holdings and real estate mutual funds is based on only one level of performance (returns) since there is no practical way of determining real estate mutual fund performance based on earnings or FFO.

[10] SUE (standardized unexpected earnings) is the quarterly earnings/share compared to earnings 4 quarters ago (divided by the standard deviation of the earnings comparison to 4 quarters ago over eight quarters); ABR are the abnormal returns around announcement; and REV6 is the six month moving average of past changes in analyst forecasted earnings. R6 is the stock compounded returns over 6 months prior to portfolio formation.

CHAPTER 3
DATA AND METHODOLOGY

This chapter covers sources of data and the methodology required to test the hypotheses for the following research questions:

1) Do announcements (property acquisition, property disposition, or dividends) affect REIT stock returns?
2) Does the level of REIT liquidity have an effect on REIT returns?
3) Do REIT risk-adjusted returns have an effect on the real estate mutual fund manager's decision to adjust the holdings of the REIT in the mutual fund?
4) Does momentum in REITs affect the manager's decision to alter the holdings level of the REIT in the real estate mutual fund?
5) Does the change in holdings of REITs in the real estate mutual fund affect risk-adjusted returns in the real estate mutual fund?
6) Is there evidence of momentum in real estate mutual funds?
7) Does real estate mutual fund momentum affect performance and/or fund flows?

A. Information Effects

A.1 Acquisition and Disposition Announcements

I obtain announcements of property acquisitions and dispositions by REITs from 1994 to 2005. Announcements are gathered from information services such as Lexis/Nexis, Business Newswire and PR Newswire. Cumulative abnormal returns are analyzed for short-term information effects of the event by looking at a (-1, 0, +1) window, where day 0 is the announcement date.

Using the market model and the estimation technique of Brown and Warner (1985), I create a parameter estimation window from one year prior to the announcement

to three months prior to the announcement (days -255 to -65). The market model is given as:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

where R_{it} is the return for REIT *i* on day *t*, R_{mt} is the return on the market index, α_i and β_i are the estimated intercept and slope, respectively for REIT *i* on day *t*, and ε_{it} is an error term.

The abnormal return for REIT *i* on day *t*, denoted AR_{it}, is given as

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt} \quad (2)$$

Cumulative abnormal returns for REIT *i*, denoted CAR_i, are formed by summing AR_{it} over various lengths of time. Average ARs and CARs are calculated and tested to see if they are different from zero.

Daily returns of REITs are obtained from the Center for Research in Securities Prices (CRSP). The CRSP NYSE/AMEX/NASDAQ equal-weighted return[11] and the REIT equity equal-weighted return[12] are used as proxies for the market return. Data are coded to differentiate between acquisitions and dispositions. This can determine which type of event has the greatest information effect.

A.2 Dividend Announcements

Dividend announcements dates are obtained from the wire services from 1994 through 2005. Information effects from dividend announcements are determined in similar manner to formulas (1) and (2) above. I will look at the information effects of dividend announcements before and after the earnings announcement. Results obtained will either confirm or refute the conclusions reached by Shilling, Sirmans and Wansley (1986).

[11] The value-weighted portfolio is biased to large-cap stocks. Since most REITs are small-cap stocks, the equal-weighted portfolio is a better measure.

[12] I construct a composite equity REIT equal-weighted return measure from the CRSP tapes. The CRSP NYSE/AMEX/NASDAQ composite returns contain returns of small capitalization, mid capitalization and large capitalization stocks. REITs are primarily small and mid capitalization stocks, so an equal-weighted equity REIT composite return would allow for a more representative abnormal return.

B. Liquidity

I investigate the relationship between returns and liquidity. Returns, bid prices and ask prices of equity REITs at the end of each quarter from December 1993 to December 2005 are obtained from the CRSP tapes[13]. Turnover is measured by the number of trades during a period divided by the average number of shares. Trading volume and average shares outstanding over the quarter are obtained from CRSP. I use the following cross-sectional model to test for the return-liquidity relationship:

$$R_i = \alpha_i + \beta_1 BAS_i + \beta_2 TURN_i + \beta_3 VOL_i + \varepsilon_i \qquad (3)$$

where R_i = Quarterly return for REIT *i*;

BAS_i = Bid-Ask Spread (difference between bid price and ask price) of REIT *i* at the end of the quarter[14];

$TURN_i$ = Shares Traded/Average Number of Shares of REIT *i* at the end of the quarter;

VOL_i = Trading volume of REIT *i* at the end of the quarter in hundreds of shares;

ε_i = an error term

Returns will be determined based on (a) closing prices and (b) the midpoint of bid and ask prices.

Equation (3) is estimated for each quarter and the results are aggregated following the procedure of Fama and Macbeth (1973). The error term represents the portion of returns not explained by the bid-ask spread or turnover. The predicted return values ($\hat{R}_i$) are represented by the following equation:

$$\hat{R}_i = \hat{\alpha} + \hat{\beta}_1 BAS_i + \hat{\beta}_2 TURN_i + \hat{\beta}_3 VOL_i \qquad (4)$$

[13] Daily bid prices and ask prices establish a daily bid-ask spread. The quarterly BAS figure is an average of the daily figures over a quarter. Quarterly turnover and trading volume figures are determined in the same fashion.

[14] Bid-Ask spread figures should decrease after the decimalization of prices in 2001. I will look at the effect before and after 4/9/2001, the first day of trading using decimal pricing..

$\hat{\alpha}$ $\hat{\beta}_1$ $\hat{\beta}_2$ $\hat{\beta}_3$

where α, β_1, β_2 and β_3 are estimated coefficients from equation (3) for each quarter.

The predicted return value for each REIT is represented by the variable LIQ, which can be used to determine the contribution of liquidity to change in portfolio holdings.

C. Prior Performance and Change in Holdings of Mutual Funds

C.1 Performance Measured by REIT Returns

A mutual fund is designed to offer investors ownership of many stocks without the high transaction costs associated with individual ownership. Depending on the objective of the fund, the mutual fund will contain varying mixes of stocks, bonds, cash and real estate. In the case of real estate mutual funds, holdings will consist primarily of REITs that cover various industry sectors (office, apartments, retail, etc.). I determine the REITs that comprise each mutual fund. The REITs' stock returns are evaluated for performance over time across all funds.

Mutual fund data is obtained from Morningstar Principia files for quarterly ending periods ending December 1994 through December 2005. From this data I extract the complete holdings information[15], and determine the stocks[16] that are in each fund. Monthly return data is obtained from the University of Chicago Center of Research and Securities Prices (CRSP). These monthly returns are compounded to form quarterly returns. International funds will not be included in the sample[17]. Non-REIT holdings by funds are not included in performance tests[18].

[15] Complete holdings of a fund include the following: the stocks that are in the fund, the percentage of total net assets (market value) of each stock in the fund portfolio, the market value of each stock's holdings (price of stock at the end of a quarter times number of shares held), the number of shares held, and the change in shares held from the prior period.
[16] Stocks are defined as the holdings of REITs in a real estate mutual fund and any other firm in the real estate mutual fund that is publicly traded (REITs, REOCs, financial services firms, or brokerage firms).
[17] The stocks which are part of an international fund portfolio may not trade on NYSE, AMEX, or Nasdaq, so return information may be unavailable.
[18] This study is centered on the performance and return persistence of REITs, and most of the stocks held by the real estate mutual funds are REITs.

I seek to determine how the performance of a particular REIT's stock along with liquidity and changes in dividend policy affects the percentage of the REIT held by a particular mutual fund. This can be done by estimating the following relationship:

$$\Delta Hld_{it} = \alpha_{0i}+\beta_{1i}(R_{it-1} - R_{mt-1})+\beta_{2i}LIQ_{it-1}+\beta_{3i}PD_{it-1}+\beta_{4i}ND_{it-1}+\varepsilon_{it}; \qquad (5)$$

where:

R_{it-1} = Return of REIT *i* for quarter *t-1*;
R_{mt-1} = Return on a market index portfolio for quarter *t-1*;
LIQ_{it-1} = Liquidity measure of REIT *i* per equation (4) for quarter *t-1*;
PD_{it-1} = Dummy variable for positive change in dividend policy of REIT *i* at quarter t-1 (one if positive change, zero otherwise);
ND_{it-1} = Dummy variable for negative change in dividend policy of REIT *i* at quarter t-1 (one if negative change, zero otherwise);
ΔHld_{it} = Change in percentage holdings[19] of REIT *i* from the end of quarter *t-1* to the end of quarter *t*.
$R_{it-1} - R_{mt-1}$ = Market-adjusted return for quarter *t-1*.

Dividend announcement information is obtained from the wire services. Announcements indicate whether the dividend is higher or lower than the previous period. A higher dividend amount at announcement is considered a positive change in dividend policy, a lower dividend amount at announcement is considered a negative dividend policy. Equation (4) is a time-series regression estimated for each REIT in each fund. Within a fund, for each quarter changes in holdings for each REIT related to the prior quarter's respective REIT return in excess of a benchmark are measured. Equation (4) is then estimated. The estimated coefficients are α_0, β_1, β_2, β_3 and β_4; ε_{it} is an error term. Funds must have a minimum of ten consecutive quarters of data. I use the NYSE/AMEX/Nasdaq equal-weighted return and the equity REIT composite equal-

[19] $\Delta Hld_{it} = (HLD_{it} - HLD_{it-1})$, where *HLD* is the percentage of total net assets (market value) of each REIT in a fund's portfolio. However, entry and exit of REITs in the respective portfolios can give misleading results. The shares of each REIT held by the fund can be used as an alternative measure.

weighted index as different proxies for the market index. If the coefficients are significantly positive then this would indicate that changes in holdings of stocks are directly related to the stock's prior performance, liquidity level, and positive or negative changes in dividend policy, respectively.

The addition of REITs to a real estate mutual fund portfolio or removal of REITs from a real estate mutual fund can distort the effects of momentum trading. For example, suppose a manager has 100 shares of REIT 1 and 50 shares of REIT 2 in his portfolio. The percentage holdings in the fund are 67% and 33%, respectively. Strong prior performance of both REITs moves the advisor to purchase 200 shares of REIT 1 and 100 shares of REIT 2. However, 450 shares of REIT 3 are purchased. The new percentage holding figures are 33% of REIT 1, 17% of REIT 2, and 50% of REIT 3. So, momentum trading produces a negative value of ΔHld in REIT 1 and REIT 2. The decision of an advisor to sell off a REIT can produce similar effects. In a manner similar to Badrinath and Wahal (2002), I will identify the REITs that initially enter and completely exit the funds in a given quarter. If $(Hld_{it} - Hld_{it-1}) = Hld_{it}$, the REIT is in an entry position. If $(Hld_{it} - Hld_{it-1}) = -Hld_{it-1}$, the REIT is in an exit position. Equation (5) will be estimated:

1) over all REITs,

2) without entry and exit REITs,

3) with entry and exit REITs together,

4) with entry and exit REITs separately.

The results generated without entry and exit REITs should offer the most accurate measure of momentum effects. Shares of REITs held by each real estate mutual fund can be used as an alternative measure. Changes in the number of REIT shares held offers a method to measure how a manager reacts to REIT momentum without giving misleading changes in percentage assets held when entry and exit REITs are included. My analysis will also look at the effects of holdings changes done at fiscal year end of the real estate mutual funds. This analysis will determine if managers engage in any window dressing at this time.

C.2 Performance Based on Earnings Changes

Earnings per share (EPS) are obtained from Compustat. Performance based on earnings is denoted EARNP, and is expressed by the following formula:

$$EARNP_t = (EPS_t - EPS_{t-1})/EPS_{t-1} \quad (6)$$

where EPS is earnings per share, reported quarterly.

The effect of earnings-based performance on change in holdings is determined thusly:

$$\Delta Hld_{it} = \alpha_{0i} + \beta_{1i}(EARNP_{it-1} - EARNP_{mt-1}) + \beta_{2i}LIQ_{it-1} + \beta_{3i}PD_{it-1} + \beta_{4i}ND_{it-1} + \varepsilon_{it}; \quad (7)$$

where:

$EARNP_{it-1}$ = Earnings performance of REIT *i* for quarter *t-1*;

$EARNP_{mt-1}$ = Equal-weighted earnings performance of equity REITs for quarter *t-1*[20];

Since earnings announcements are made after the quarter ends, the earliest the mutual fund manager can alter holdings based on the earnings announcement is in the following quarter. I will account for the effects of entry and exit REITs in a manner similar to Section C.1.

C.3 Performance Based on Funds from Operations (FFO)

FFO (the industry accepted measure of REIT performance) data are obtained from Compustat. FFO is determined by taking a REIT's net income as determined by GAAP (excluding net acquisition and disposition of assets) and adding back real estate depreciation. Performance based on FFO is denoted FFOP, expressed by the following formula:

$$FFOP_t = (FFO_t - FFO_{t-1})/FFO_{t-1} \quad (8)$$

[20] $EARNP_{mt} = (EARN_{mt}-EARN_{mt-1})/EARN_{mt-1}$. $EARN_{mt}$ is the equal-weighted composite equity REIT earnings. Earnings figures (net income at the end of quarter) are obtained from Compustat.

The effect of performance on change in holdings is determined thusly:

$$\Delta Hld_{it} = \alpha_{0i}+\beta_{1i}(FFOP_{it-1} - FFOP_{mt-1})+\beta_{2i}LIQ_{it-1}+\beta_{3i}PD_{it-1}+\beta_{4i}ND_{it-1}+\varepsilon_{it}; \qquad (9)$$

where:

$FFOP_{it-1}$ = FFO performance of REIT *i* for quarter *t-1*;
$FFOP_{mt-1}$ = Equal-weighted FFO performance of equity REITs for quarter *t-1*[21];

Since FFO announcements are made after the quarter ends, the earliest the mutual fund manager can alter holdings based on the FFO announcement is in the following quarter. I will account for the effects of entry and exit REITs in a manner similar to Section C.1.

D. Momentum in REITs and Change in Holdings of Mutual Funds

Mutual fund managers may require some level of sustained performance before making a commitment to change the amount of a REIT in a fund's portfolio. To this end, it is necessary to determine if REITs show persistence in performance, and whether it contributes to the manager's decision. Positive performance persistence will contribute to a positive change in the percentage of stocks held in a fund's portfolio.

I form momentum portfolios in a manner similar to Chui, Titman and Wei (2003). At the end of each quarter, REITs in each fund are ranked in ascending order based on the past six month returns. The top thirty percent of securities comprise the winner (W) portfolio and the bottom thirty percent the loser (L) portfolio. The portfolios are created

[21] $FFOP_{mt} = (FFO_{mt}-FFO_{mt-1})/FFO_{mt-1}$. FFO_{mt} is the equal-weighted composite equity REIT FFO. FFO is determined by taking a REIT's net income as determined by GAAP (excluding net acquisition and disposition of assets) and adding back real estate depreciation. These are quarterly figures obtained from Compustat.

in this fashion to allow for an adequate number of securities in each group[22]. The holdings hypothesis is then tested with the momentum portfolios (winners minus losers). The average change in holdings of the winner and loser portfolios, respectively, are regressed on the quarterly returns of the momentum portfolio as:

$$M\Delta Hld_{jt} = \alpha_{0j} + \beta_{1j} (W\text{-}L)_{jt-1} + \varepsilon_{jt}; \qquad (10)$$

where:

$(W\text{-}L)_{jt-1}$ = Return of momentum portfolio in each fund[23] *j* for quarter *t-1*;
$M\Delta Hld_{jt}$ = Average change in percentage holdings in fund *j* of REITs in the winner-loser portfolio[24] for the fund from the end of quarter *t-1* to the end of quarter *t*.

Equation (10) is a time-series regression that is estimated for each fund. A positive value for β_1 would indicate that stock momentum affects mutual fund holdings such that funds increase (decrease) holdings of winners (losers).

E. Change in Holdings, Mutual Fund Performance and Momentum

If the prior REIT performance is directly correlated with changes in holdings in a fund, and if momentum in REITs exists, then the positive fund performance should follow. In order to explore this I estimate the following cross-sectional relationship:

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[22] A typical real estate mutual fund has 75 securities in its portfolio at any given period. Breakpoints of 40 percent and 60 percent for loser and winner portfolios, respectively, will be used for the study, along with a 50 percent breakpoint These will allow for more powerful statistical tests.

[23] For each fund $(W\text{-}L)_{t-1}$ is the returns of REITs in the winner portfolio less the returns of REITs in the loser portfolio for the previous quarter. This value is different for each fund. For a given fund, the winner portfolio is computed by weighting each REIT's return by the proportion of shares held by the fund for that REIT. In other words, the winner portfolio is value-weighted. The loser portfolio return for a fund is computed in a similar manner.

[24] $M\Delta Hld_{jt}$ is the average change in holdings of all REITs in the winner portfolio less the average change in holdings of all REITs in the loser portfolio. This amount is calculated at the end of a quarter for each fund. This value is different for each fund. For a given fund, the change in holdings in the winner portfolio is computed as follows. For each REIT in the winner portfolio ΔHld_{it} is computed as in footnote 18. Each ΔHld_{it} is then weighted by the proportion of shares held by the fund for that REIT. The loser portfolio change in holdings is computed in a similar manner.

$$R_{jt} = \alpha_o + \beta_1 M\Delta Hld_{jt} + \beta_2 lnSize_{jt} + \varepsilon_{jt}, \quad (11)$$

where:

R_{jt} = Return of fund[25] j for quarter t;

$lnSize_{jt}$ = Natural logarithm of net asset value of mutual fund j at the end of quarter t-1,

Equation (11) is estimated cross-sectionally at a given point in time, employing all contemporaneous values. NAV and D values are taken from the Morningstar Principia quarterly database. The $M\Delta Hld$ variable is the momentum measure. Size is included to control for potential relationships between fund size and returns. A log transformation is used to account for skewness in the size distribution. A positive value for β_1 shows that changes in holdings in the momentum portfolios influences fund returns. The change in holdings is directly related to fund performance. There should be an inverse relationship between size and fund returns.

The null hypothesis states that the change in holdings of REITs within funds over quarterly periods will not have a relationship with the fund returns. Rejection of the null hypotheses will show that changes in holdings of REITs in a fund affect performance. Prior performance of REITs leads to persistence in returns. Positive changes in REIT holdings lead to improved fund performance.

[25] R_{jt}= (NAV_{jt}- NAV_{jt-1}+D_{jt})/NAV_{jt-1}, where NAV is net asset value per share of real estate mutual fund j and D_{jt} is the distribution paid by fund j at time t.

CHAPTER 4
RESULTS

A. Descriptive Statistics

The analysis of fund behavior and the performance of REITs held by the funds are shown in Table I. Panel A looks at REITs. The average market capitalization of equity REITs has increased steadily over the twelve year period (1994 – 2005) from over $1.32 billion among 81 REITs to $4.18 billion among 166 REITs. Average quarterly returns approaching 16% appear at the end of December 1996 and June 2003. The greatest number of REIT IPO's occurred from 1995 to 1997; the average quarterly returns in 1996 to 1998 reflect the market's reaction to this period of tremendous REIT activity. The average quarterly returns from 1998-2000 ran counter to the equity performance during the tech bubble period. Average market-adjusted returns are negative from the fourth quarter 1998 to first quarter 2000. REIT returns improved during the bear market period of mid-2000 to the end of 2002. There are large average quarterly market-adjusted return fluctuations however, ranging from +20.72% to -19.89%.[26] The share price of REITs has moved in similar fashion; only in late 2003 has the price level of REITs returned to those of the pre-tech bubble period. A typical REIT purchased by a fund manager will be about 2% of the total fund portfolio, as shown in the average percentage hold column.

The mutual fund activity is shown in Panel B. The number of real estate mutual funds has grown from 34 at the end of 1994 to 259 at the end of 2005. The average price level of mutual funds (measured by NAV) is at a high of $18.57 in 1997, drops to a low of $10.16 in 1999, and shows steady increases from 2001 to a high of $23.69 at the end of 2004. The quarterly returns of mutual funds show similar patterns to the REIT returns.

[26] The CRSP NYSE/AMEX/Nasdaq equal-weighted market capitalization index is used. Later analysis will use a more industry related index such as the NAREIT (National Association of Real Estate Investment Trusts) composite index.

B. Information Effects

B.1 Property Acquisition and Disposition Announcements

In an efficient market, prices should immediately adjust to any new information; that is, no abnormal returns should exist. I look at 13,091 equity REIT property acquisition and 1,454 disposition announcements from 1994 to 2005. I use the market model to test for abnormal returns around various announcement windows.

I use Table II to show the information effects around a three day announcement window (1 day before, day of, and 1 day after the announcement; designated [-1, +1]). I also look at windows of [0, +1], [0], and [-1, +10]. The [-1, +10] window looks at possible post-announcement drift. The first column reflects results using the NYSE/AMEX/Nasdaq equal-weighted return as a market index measure. There is a mean abnormal return of 0.033% (t-statistic of 1.13) around the three day announcement window. A mean abnormal return of 0.029% is found around the two day announcement window. A mean abnormal return of 0.084% (t-statistic of 1.74) is found on the day of announcement. I find an average abnormal return of -0.015% (t-statistic of -1.14). I find information effects only at the day of announcement using the equal-weighted market measure.

The second column uses the NYSE/AMEX/Nasdaq value-weighted return as a market index measure. There is no evidence of information effects around the four announcement windows. The result is somewhat surprising considering a larger abnormal return is expected with the value-weighted return.

The third column uses a composite equal-weighted return of all equity REITs as a market measure. This should produce a better representation of abnormal returns since the characteristics of the underlying securities are similar. I find no evidence of information effects around the chosen announcement windows.

The fourth column uses a composite value-weighted return of all equity REITs as a market measure. Most equity REITs are small to medium market capitalization

securities; only five REITs are in the large market capitalization category. The twelve day announcement window has a significant information effect (average abnormal return of -.024% with a t-statistic of -1.74), suggesting some post-announcement drift.

Overall I find little evidence of information effects from the overall property acquisitions and dispositions sample. I also test for evidence of information effects from property acquisitions only, then property dispositions only.

B.1.1 Property Acquisition Announcements Only

I test for information effects in a sub-sample of property acquisitions only. This sub-sample accounts for approximately 70% of the overall sample. When the sample of announcements is limited to property acquisitions there is a stronger information effect.

I show the results in Table III. The first column uses the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. I find evidence of information effects on the day of announcement, showing an average abnormal return of 0.093% at a 10% level of significance (t-statistic of 1.88). Property acquisitions normally are perceived by the market as a positive signal, so this is a consistent result. When I look at the twelve day window, a significant result is also present at a 10% level of significance (average abnormal return of -0.025%, t-statistic of -1.90). This result suggests an initial positive reaction to the announcement on day zero and then a drift to negative abnormal returns.

A test is run with the value-weighted market return; I find evidence of information effects over the twelve day announcement window at a 1% level of significance. There is an average abnormal return of -0.035% over the period (t-statistic of -2.63). When the REIT value-weighted return is used as the market measure similar results are found (an average abnormal return of -0.038% with a t-statistic of -2.74). This equates to a cumulative abnormal return of -0.26% over the twelve day announcement window, suggesting a noticeable negative market reaction after the initial acquisition announcement. Value-weighted returns are generally smaller than equal-weighted returns. The larger market capitalization REITs would produce more high profile

property transactions. The transactions are more likely to generate greater initial market overreaction, leading to negative abnormal returns.

B.1.2 Property Disposition Announcements Only

I test for information effects in a sub-sample of property dispositions only. This sub-sample accounts for approximately 30% of the overall sample. When the sample of announcements is limited to property dispositions there is a much stronger short-term information effect.

I show the results in Table IV. The first column uses the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. I find no evidence of information effects around the four announcement windows. Property dispositions can be perceived by the market as a positive signal (the REIT is removing poor performing assets from the portfolio), so I would expect information leakage and a positive abnormal returns prior to the announcement date. When I test for information effects around the three day announcement window using the different market proxies I find significant results at the 10% level. The NYSE/AMEX/Nasdaq equal-weighted return measure is the only one that does not have a significant result. Not only are the results statistically significant, they are also economically significant (an average abnormal return of over 0.2%). The results suggest a much greater market reaction to disposition of property. Usually property is removed from a portfolio when it is a poor performer, so intuitively the strong market reaction makes sense.

The only other significant results appear at the twelve day announcement window using the NYSE/AMEX/Nasdaq value-weighted return as a market proxy. I find an average abnormal return of 0.087% (t-statistic of 1.66). The positive sign suggests a diminished overreaction effect, and a permanent positive effect consistent with my hypothesis.

B.2. Dividend Announcements

In order to qualify for exemption from corporate taxes, REITs are required to distribute 90% of their net income to REIT shareholders in the form of dividends. Dividend announcements (identified by the declaration date) generally occur after earnings announcements. Since REIT shareholders expect dividends there should be no market reaction to the announcements. I look at 5,932 dividend announcements from 1994 to 2005. I use the market model to test for abnormal returns around various announcement windows.

I use Table V to show the information effects around a three day announcement window (1 day before, day of, and 1 day after the announcement; designated [-1, +1]). I also look at windows of [0, +1], [0], and [-1, +10]. The [-1, +10] window looks at possible post-announcement drift. The first column reflects results using the NYSE/AMEX/Nasdaq equal-weighted return as a market index measure. There is a mean abnormal return of 0.098% (t-statistic of 6.84) around the three day announcement window. A mean abnormal return of 0.144% is found around the two day announcement window (t-statistic of 8.07). A mean abnormal return of 0.146% (t-statistic of 1.74) is found on the day of announcement. I find an average abnormal return of 0.066% (t-statistic of 9.68). All results are significant at the 1% level. Surprisingly, I find very strong information effects from dividend announcements using the equal-weighted market measure. Not only are the results statistically significant, but economically significant as well (the day of announcement abnormal return projects to a monthly return of 3.1%)

The second column uses the NYSE/AMEX/Nasdaq value-weighted return as a market index measure. There is similar evidence of information effects around the four announcement windows, although the average abnormal returns are lower than those produced using the NYSE/AMEX/Nasdaq equal-weighted return as a market index measure. The result is somewhat surprising considering a larger abnormal return is expected with the value-weighted return.

The third column uses a composite equal-weighted return of all equity REITs as a market measure. This should produce a better representation of abnormal returns since the characteristics of the underlying securities are similar. There is similar evidence of information effects around the four announcement windows, although the average abnormal returns are lower than those produced using the NYSE/AMEX/Nasdaq equal-weighted and value-weighted return as a market index measure.

The fourth column uses a composite value-weighted return of all equity REITs as a market measure. Most equity REITs are small to medium market capitalization securities; only five REITs are in the large market capitalization category. Even the twelve day announcement window has a significant information effect (average abnormal return of .048% with a t-statistic of 6.88). The decrease in average abnormal returns from one day before the announcement to ten days after the announcement suggests some post-announcement drift.

Overall I find strong evidence of information effects from the overall dividend announcements sample. Shilling, Sirmans and Wansley (1986) find with a stable dividend payout policy, information content exists if the dividend announcement occurs before the earnings announcement, but not after the earnings announcement. I test for information effects by dividend announcements before and after the earnings announcement.

B.2.1 Dividend Announcements before Earnings Announcements

I use Table VI to look at 1,171 dividend announcements before the earnings announcement date. The first column reflects results using the NYSE/AMEX/Nasdaq equal-weighted return as a market index measure. There is a mean abnormal return of 0.088% (t-statistic of 2.99) around the three day announcement window. A mean abnormal return of 0.138% is found around the two day announcement window (t-statistic of 3.67). A mean abnormal return of 0.152% (t-statistic of 3.21) is found on the day of announcement. I find an average abnormal return of 0.042% (t-statistic of 2.95)

over the twelve day announcement window. All results are significant at the 1% level. The average abnormal return on the day of dividend announcement is higher in this sample than the overall sample.

The second column uses the NYSE/AMEX/Nasdaq value-weighted return as a market index measure. There is a mean abnormal return of 0.075% (t-statistic of 2.54) around the three day announcement window. This result is significant at the 5% level. A mean abnormal return of 0.121% is found around the two day announcement window (t-statistic of 3.21) at a 1% significance level. A mean abnormal return of 0.135% (t-statistic of 2.83) is found on the day of announcement at a 1% significance level. An average abnormal return of 0.033% (t-statistic of 2.31) is found around the twelve day announcement window at a 5% significance level. The average abnormal return on the day of dividend announcement is higher in this sample than the overall sample, similar to the equal-weighted index.

The third column uses a composite equal-weighted return of all equity REITs as a market measure. This should produce a better representation of abnormal returns since the characteristics of the underlying securities are similar. There is a mean abnormal return of 0.087% (t-statistic of 3.12) around the three day announcement window. A mean abnormal return of 0.136% is found around the two day announcement window (t-statistic of 3.79). A mean abnormal return of 0.158% (t-statistic of 3.48) is found on the day of announcement. An average abnormal return of 0.036% (t-statistic of 2.68) is found around the twelve day announcement window. All results are significant at the 1% level. The average abnormal return on the day of dividend announcement is the highest with this index measure.

The fourth column uses a composite value-weighted return of all equity REITs as a market measure. There is a mean abnormal return of 0.063% (t-statistic of 2.13) around the three day announcement window. This result is significant at the 5% level. A mean abnormal return of 0.128% is found around the two day announcement window (t-statistic of 3.00) at a 1% significance level. A mean abnormal return of 0.128% (t-statistic of 2.67) is found on the day of announcement at a 1% significance level. An

average abnormal return of 0.029% (t-statistic of 2.03) is found around the twelve day announcement window at a 5% significance level. The average abnormal return on the day of the dividend announcement is higher in this sample than the overall sample, similar to the other market indices. The decrease in average abnormal returns from one day before the announcement to ten days after the announcement suggests some post-announcement drift.

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B.2.2 Dividend Announcements after Earnings Announcements

I use Table VII to look at 3,252 dividend announcements before the earnings announcement date. The first column reflects results using the NYSE/AMEX/Nasdaq equal-weighted return as a market index measure. There is a mean abnormal return of 0.084% (t-statistic of 4.85) around the three day announcement window. A mean abnormal return of 0.126% is found around the two day announcement window (t-statistic of 3.67). A mean abnormal return of 0.079% (t-statistic of 2.56) is found on the day of announcement. I find an average abnormal return of 0.079% (t-statistic of 9.49) over the twelve day announcement window. All results are significant at the 1% level, except at day of announcement (5%.significance level). I find a much lower average abnormal return at day of announcement (48% lower than the before earnings announcement sample).

The second column uses the NYSE/AMEX/Nasdaq value-weighted return as a market index measure. There is a mean abnormal return of 0.067% (t-statistic of 3.93) around the three day announcement window. This result is significant at the 1% level. A mean abnormal return of 0.110% is found around the two day announcement window (t-statistic of 5.16) at a 1% significance level. A mean abnormal return of 0.066% (t-statistic of 2.13) is found on the day of announcement at a 5% significance level. An average abnormal return of 0.069% (t-statistic of 8.38) is found around the twelve day announcement window at a 1% significance level. Again, a much lower average abnormal return at the day of the announcement is found.

The third column uses a composite equal-weighted return of all equity REITs as a market measure. There is a mean abnormal return of 0.044% (t-statistic of 1.66) around the three day announcement window. A mean abnormal return of 0.099% is found around the two day announcement window (t-statistic of 4.20). The average abnormal return is insignificant on the day of announcement. An average abnormal return of 0.032% (t-statistic of 2.51) is found around the twelve day announcement window at a 5% significance level.

The fourth column uses a composite value-weighted return of all equity REITs as a market measure. There is a mean abnormal return of 0.045% (t-statistic of 2.48) around the three day announcement window. This result is significant at the 5% level. A mean abnormal return of 0.085% is found around the two day announcement window (t-statistic of 3.71) at a 1% significance level. The average abnormal return is insignificant on the day of announcement. An average abnormal return of 0.053% (t-statistic of 6.03) is found around the twelve day announcement window at a 1% significance level.

Overall, there is a significant information effect from dividend announcements, especially at the day of announcement. The abnormal returns are very strong (maximum average abnormal return of 0.158%). Dividend announcements made before the earnings announcements have a greater information effect than dividend announcements made after earnings announcements. When the dividend announcement occurs after the earnings announcement (which is normal) there is no information effect on the day of the announcement using the REIT-based market indices. This result is consistent with the original hypothesis.

C. Prior REIT Performance and Change in Mutual Fund Holdings

I hypothesize the prior performance of REITs has a positive relationship with the change in holdings within a real estate mutual fund. A REIT that does well will have more shares purchased by a fund manager, subsequently increasing the percentage of the REIT held by the fund.

A REIT will also have a higher probability of being traded if it has a higher liquidity level than another REIT. The liquidity measure is a function of bid-ask spread, turnover and volume, three common measures of liquidity. The level of liquidity should have a positive effect with changes in mutual fund holdings. Changes in dividend policy can also spur changes in holdings.

The effects of lagged abnormal returns, liquidity and dividend policy on the change in holdings of a REIT by a mutual fund is shown in Table VIII. Equation (5) is estimated for each fund. Using a Fama and MacBeth (1973) approach, regression coefficients are averaged across funds to produce the reported values in Table VIII. The standard error of the fund coefficients are employed to produced reported t-statistics. Panel A uses the NYSE/AMEX/Nasdaq equal-weighted returns as a market proxy. I find no evidence of lagged market-adjusted returns affecting changes in holdings, keeping liquidity and dividend policy changes constant. The expected positive sign is evident. There is a significant positive intercept that suggests an increase in the average holding of a REIT by a mutual fund of 0.3254% if all independent variables were zero. This result is significant at the 1% level. A one percent increase in liquidity based returns will produce a change in the average holding of 0.4564%. This result is also significant at the 1% level. The results suggest that returns as a function of bid-ask spread and turnover have a strong effect on the decision of a fund manager to alter the percent holdings of a REIT in the mutual fund; a more liquid REIT would be more susceptible to a fund manager trading it. There are no significant results from changes in dividend policy.

Panel B uses the composite equity REIT equal-weighted returns as a market proxy. I find no evidence of lagged market-adjusted returns affecting changes in holdings, keeping liquidity and dividend policy changes constant. The expected positive sign is evident. There is a significant positive intercept that suggests an increase in the average holding of a REIT by a mutual fund of 0.3323% if all independent variables were zero. This result is significant at the 1% level. A one point increase in liquidity based returns will produce a change in the average holding of 0.4604%. This result is also significant at the 1% level. This result, as with the NYSE/AMEX/Nasdaq market measure, suggests that returns as a function of bid-ask spreads and turnover have a strong

effect on the decision of a fund manager to alter the percent holdings of a REIT in the mutual fund; a more liquid REIT would be more susceptible to a fund manager trading it. There are no significant results from changes in dividend policy.

Similar effects of the intercept and liquidity are evident when I use the NYSE/AMEX/Nasdaq and REIT composite value-weighted returns. The results are shown in Panels C and D, respectively. There is evidence of market-adjusted returns having a positive effect on changes in percentage holdings of REITs by mutual funds. A one point change in percentage market-adjusted returns on the NYSE/AMEX/Nasdaq value-weighted portfolio produces a change in holdings of 0.3087% per REIT in a mutual fund portfolio. This result is significant at the 5% level. A one point change in percentage market-adjusted returns on the REIT composite value-weighted portfolio produces a change in holdings of 0.2859% per REIT in a mutual fund portfolio. This result is significant at the 10% level. There is still no evidence of dividend policy effects.

A correlation table displaying the relationship between the dependent variable ΔHld_{it} (change in percent holdings), $R_{it-1} - R_{mt-1}$ (lagged market-adjusted returns), LIQ_{it-1} (lagged returns based on liquidity factors bid-ask spread, turnover and volume), PD_{it-1} (lagged dummy for positive dividend policy), and ND_{it-1} (lagged dummy for negative dividend policy) is shown in table IX. The correlation values are low, so there is no reason to be concerned with multicollinearity issues.

C.1 Effects of Entry and Exit REITs

The addition of REITs to a real estate mutual fund portfolio or removal of REITs from a real estate mutual fund can distort the effects of momentum trading. For example, suppose a manager has 100 shares of REIT 1 and 50 shares of REIT 2 in his portfolio. The percentage holdings in the fund are 67% and 33%, respectively. Strong prior performance of both REITs moves the advisor to purchase 200 shares of REIT 1 and 100 shares of REIT 2. However, 450 shares of REIT 3 are purchased. The new percentage

holding figures are 33% of REIT 1, 17% of REIT 2, and 50% of REIT 3. So, momentum trading produces a negative value of ΔHld in REIT 1 and REIT 2. The decision of an advisor to sell off a REIT can produce similar effects. In a manner similar to Badrinath and Wahal (2002), I identify the REITs that initially enter and completely exit the funds in a given quarter. If $(Hld_{it} - Hld_{it-1}) = Hld_{it}$, the REIT is in an entry position. If $(Hld_{it} - Hld_{it-1}) = -Hld_{it-1}$, the REIT is in an exit position. Table VIII estimates results for all REITs. I now estimate equation (5) for the REITs sample:

1) without entry and exit REITs,
2) with entry and exit REITs together,
3) with entry and exit REITs separately

C.1.1 Effects without Entry and Exit REITs

The results generated without entry and exit REITs should offer the most accurate measure of effects on changes in percent holdings. I use Table X to display the appropriate results.

Panel A shows the effects using the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. Only the liquidity-based returns are significant. A change of one percent in liquidity-based returns produces a change in percentage holdings of 0.3159%. This result is significant at the 5% level.

Panel B shows the effects using the NYSE/AMEX/Nasdaq value-weighted return as a market proxy. If market-adjusted returns, liquidity, and dividend policy values are zero, the intercept contributes 0.1526% to change in percent holdings. This result is significant at the 10% level. A one percent change in lagged market-adjusted returns increases the change in percent holdings by 0.4163%. This result is significant at the 5% level. A one percent change in lagged liquidity-based returns increases the change in percent holdings by 0.3559%. This result is also significant at the 5% level.

Panel C shows the effects using the composite equity REIT equal-weighted return as a market proxy. A one percent change in lagged market-adjusted returns increases the change in percent holdings by 0.2892%. This result is significant at the 5% level. A one percent change in lagged liquidity-based returns increases the change in percent holdings by 0.3216%. This result is also significant at the 5% level.

Panel D shows the effects using the composite equity REIT value-weighted return as a market proxy. If market-adjusted returns, liquidity, and dividend policy values are zero, the intercept contributes 0.1573% to change in percent holdings. This result is significant at the 10% level. A one percent change in lagged market-adjusted returns increases the change in percent holdings by 0.3906%. This result is significant at the 1% level. A one percent change in lagged liquidity-based returns increases the change in percent holdings by 0.3507%. This result is also significant at the 1% level.

Overall, REITs that remain in the real estate mutual fund portfolio from quarter to quarter have a greater contribution to the change in percentage holdings of REITs in a fund. This conclusion is evident from the significant results offered by market-adjusted returns. The overall sample produces significant relationships between market-adjusted returns and change in percent holdings only with the composite REIT market proxy measures.

C.1.2 Effects of Entry and Exit REITs Only

I use Table XI to display the results of a sample of only entry and exit REITs. Panel A shows the effects using the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. If market-adjusted returns, liquidity, and dividend policy values are zero, the intercept contributes 1.5291% change in percent holdings. This result is significant at the 1% level. A one percent change in lagged market-adjusted returns decreases the change in percent holdings by -0.9829%. This result is significant at the 10% level. A change of one percent in liquidity-based returns produces a change in percentage holdings of 1.1539%. This result is significant at the 5% level.

Panel B shows the effects using the NYSE/AMEX/Nasdaq value-weighted return as a market proxy. If market-adjusted returns, liquidity, and dividend policy values are zero, the intercept contributes 1.5319% to change in percent holdings. This result is significant at the 1% level. A one percent change in lagged liquidity-based returns increases the change in percent holdings by 1.1065%. This result is significant at the 5% level.

Panel C shows the effects using the composite equity REIT equal-weighted return as a market proxy. If market-adjusted returns, liquidity, and dividend policy values are zero, the intercept contributes 1.5630% change in percent holdings. This result is significant at the 1% level. A one percent change in lagged market-adjusted returns increases the change in percent holdings by -0.8834%. This result is significant at the 10% level. A one percent change in lagged liquidity-based returns increases the change in percent holdings by 1.1745%. This result is also significant at the 5% level.

Panel D shows the effects using the composite equity REIT value-weighted return as a market proxy. If market-adjusted returns, liquidity, and dividend policy values are zero, the intercept contributes 1.1586% to change in percent holdings. This result is significant at the 1% level. A one percent change in lagged liquidity-based returns increases the change in percent holdings by 1.1028%. This result is significant at the 5% level.

Overall, the liquidity of REITs entering and exiting positively influences the change in holdings.

C.1.3 Effects of Entry REITs Only

I use Table XII to display the results of a sample of only entry REITs. Panel A shows the effects using the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. If market-adjusted returns, liquidity, and dividend policy values are zero, the intercept contributes 1.5583% change in percent holdings. This result is significant at the

1% level. A one percent change in lagged market-adjusted returns decreases the change in percent holdings by 2.2819%. This result is also significant at the 1% level. Liquidity has no contribution to change in percentage holdings in this sample. Changes in positive and negative dividend policy have a negative relationship with changes in percent holdings. Positive dividend policy changes decrease percent holdings by 0.2654%. This result is significant at the 5% level. Negative dividend policy changes decrease percent holdings by 0.5629%. This result is significant at the 10% level. Similar results are generated when the other market proxies are used. The results are shown in Panel B, Panel C and Panel D for NYSE/AMEX/Nasdaq value-weighted, equity REIT composite equal-weighted and equity REIT value-weighted portfolios, respectively.

C.1.4 Effects of Exit REITs Only

I use Table XIII to display the results of a sample of only exit REITs. Panel A shows the effects using the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. A one percent change in lagged market-adjusted returns increases the change in percent holdings by 2.0782%. This result is significant at the 1% level. A one percent change in liquidity-based returns increases the change in percent holdings by 1.6161%. This result is also significant at the 1% level. Changes in negative dividend policy have a positive relationship with changes in percent holdings. Negative dividend policy increases changes in percent holdings by 0.7503%, consistent with the expected behavior of an investor when faced with a decrease in dividend payouts. This result is significant at the 10% level. Similar results are generated when the other market proxies are used. The results are shown in Panel B, Panel C and Panel D for NYSE/AMEX/Nasdaq value-weighted, equity REIT composite equal-weighted and equity REIT value-weighted portfolios, respectively.

C.2 Sub-period Effects

My sample period covers distinct and different economic periods. Years 1995 to 1997 marked a big REIT IPO period. The year 1998 through the end of March 2000 was

the tech bubble period and real estate as an investment opportunity suffered. Why invest in a relatively non-liquid asset when you can get 50% returns? April 2000 to end of September 2001 covers the period of the tech bubble crash. The recovery period covers the rest of the sample. I use Table XIV to test for the most influential sub-period.

Panel A shows the results during the pre-tech bubble period (sample dates 1/1/1994 to 12/31/1997). I find no evidence of a relationship between market-adjusted returns, liquidity-based returns, dividend policy and the change in percent holdings of REITs in a real estate mutual fund.

Panel B shows the results during the tech bubble period (sample dates 1/1/1998 to 3/31/2000). I find evidence of a relationship between market-adjusted returns and change in percent holdings. A one percent increase in market-adjusted returns produces a change in percent holdings of 1.247%. This result is significant at the 10% level. This result is somewhat surprising, as the tech bubble period represented a great deal of real estate non-investment and divestiture.

Panel C shows the results during the bubble crash period (sample dates 4/1/2000 to 9/30/2002). If market-adjusted returns, liquidity, and dividend policy values are zero, the intercept contributes a -2.5849% change in percent holdings, significant at the 5% level. An increase of one percent in market-adjusted returns increases the change in percent holdings by 0.7211%. This result is significant at the 10% level. An increase of one percent in liquidity-based returns increases the change in percent holdings by 0.4469%. This result is significant at the 10% level.An increase in dividends increases the change in percent holdings by 0.3632%. This result is significant at the 1% level. These results suggest there was increased investment in real estate related assets during this period and investors held on to these assets. An increase in dividend payout also contributed to investment.

Panel D shows results after the bubble crash period (sample dates 10/1/2002 to 12/31/2005). If market-adjusted returns, liquidity, and dividend policy values are zero, the intercept contributes a 0.3254% change in percent holdings, significant at the 5% level. An increase of one percent in market-adjusted returns increases the change in percent holdings by 0.2859%. This result is significant at the 10% level. An increase of

one percent in liquidity-based returns increases the change in percent holdings by 0.4604%. This result is significant at the 1% level.

Overall the tech bubble crash period and the period after the tech bubble crash had the most profound effect on changes in holdings. Real estate related assets became attractive again when the exuberance of the bubble period disappeared and cooler heads prevailed.

D. Effects of Ex-Post Performance Measures on Change in Percentage Holdings

D.1 Performance Based on Earnings per Share (EPS)

I test for the effects of earnings performance based market-adjusted returns based on changes in percentage holdings. Earnings performance (EARNP) is the percentage change of EPS for a given security over the prior quarter. I use Table XV to show the results. The intercept and liquidity coefficients are significant at the 1% level (t-statistics >5). If market-adjusted returns, liquidity-based returns and dividend policy are zero, the intercept in this model contributes an increase in percentage holdings of 0.595%. A one percent change in liquidity-based returns leads to a change in percentage holdings of 0.8167%. A one percent change in market-adjusted earnings performance produces a change in percentage holdings of only 0.0132%. This result is significant at the 5% level. The ex-post measure of earnings per share does not contribute to change in holdings. REIT earnings do not offer an accurate measure of performance, since items such as net acquisitions and amortization are not included.

D.1.1 Entry and Exit REITs: The Effect on EPS-Based Performance

I test for the effects of entry and exit REITs on the EPS analysis. I display the results in Table XVI. Panel A is used to show the effects of the entire sample, using the NYSE/AMEX/Nasdaq equal-weighted index as a market proxy. Panel B uses a sample without entry and exit REITs, using the NYSE/AMEX/Nasdaq equal-weighted index as a market proxy. Panel C uses a sample with entry and exit REITs only, using the NYSE/AMEX/Nasdaq equal-weighted index as a market proxy. Panel D uses a sample

with only exit REITs, using the NYSE/AMEX/Nasdaq equal-weighted index as a market proxy. No significant effects are found, except with the negative intercept when the entry and exit REITs are excluded. Similar results are found using the other market proxies. I conclude that an ex-post measure such as EPS is not affected by entry and exit REITs.

Overall, the ex-post measure of earnings per share does not contribute to change in holdings. REIT earnings do not offer an accurate measure of performance, since items such as net acquisitions and amortization are not included.

D.2 Performance Based on Funds From Operations (FFO)

I test for effects of funds from operations performance based abnormal returns based on changes in percentage holdings. Funds from operations performance (FFOP) is the percentage change of FFO for a given security over the prior quarter. I use Table XVII to show the results. The intercept and liquidity coefficients are significant at the 1% level (t-statistic >4). The intercept in this model contributes an increase in percentage holdings of 0.5091%. A one level change in liquidity-based returns leads to a change in percentage holdings of 0.6935%. A one percent change in market-adjusted FFO performance produces a change in percentage holdings of only 0.0017%. This result is significant at the 1% level. The table only shows the results using the NYSE/AMEX/Nasdaq equal-weighted returns as a market proxy; the results using the other market proxies are similar. The significant results with market-adjusted FFO performance support the use of FFO as the REIT industry performance standard.

D.2.1 Entry and Exit REITs: The Effect on FFO-Based Performance

I test for the effects of entry and exit REITs on the FFO analysis. I display the results in Table XVIII. Panel A is used to show the effects of the entire sample, using the NYSE/AMEX/Nasdaq equal-weighted index as a market proxy. Panel B uses a sample without entry and exit REITs, using the NYSE/AMEX/Nasdaq equal-weighted index as a market proxy. Panel C uses a sample with entry and exit REITs only, using the NYSE/AMEX/Nasdaq equal-weighted index as a market proxy. Panel D uses a sample with only exit REITs, using the NYSE/AMEX/Nasdaq equal-weighted index as a

market proxy. Exit REITs contribute a change in percentage holdings of 1.89% in a REIT mutual fund portfolio. The result is significant at the 10% level. Similar results are found using the other market proxies. I conclude that an ex-post measure such as FFO is influenced by entry and exit REITs. This again shows that in the case of ex-post performance, FFO is a better measure.

E. Momentum and the Effect on Change in Holdings

Abnormal returns have an effect on change in holdings. Momentum portfolio theory suggests abnormal returns can be generated by buying past winners and selling past losers based on a lagged formation period that establishes winner (top performers) and loser (bottom performers) portfolios. Jegadeesh and Titman (1993) find evidence of momentum in stocks over 3-12 month portfolio formation periods and 3-12 month holding periods. Titman, Chui and Wei (2003) find momentum in equity REITs. I use variations of the methodologies used in these studies to determine if momentum in REITs contribute to changes in holdings. Since there is a limited number of REITs that can comprise a portfolio (174 publicly traded REITs in 2005 for example) there should be limited effects gained from a momentum portfolio.

I use quarterly equity REIT returns and create portfolios based on 3 month, 6 month, 9 month and 12 month formation periods, then holding for 12 months after portfolio formation. Winner and loser portfolios are created based on the top third and bottom third. I also look at portfolios splitting the sample in half. A winner minus loser (W –L) portfolio return is produced from the difference of mean returns in the winner portfolio and mean returns in the loser portfolio. Each portfolio is rebalanced quarterly instead of monthly. Summary statistics of the portfolios are shown in Table XIX. I find no significant results for average W –L portfolio returns. The largest returns are generated in the four quarter formation, four quarter holding period returns.

W – L portfolio returns are generated each quarter. REIT returns in the winner and loser portfolios are weighted by the percentage holding of the REIT in each real estate mutual fund. As a result, there are different W – L values for each fund quarter. Percentage holdings of REITs that reside in the winner and loser portfolios, respectively,

are averaged to create the value of MΔHld. The equation (10) regression is estimated for portfolios created one, two, three and four quarters before the formation date. All portfolios are held for four quarters after the formation date. Winner and loser portfolios comprise of the top third and bottom third of returns in one scenario, and the top half and bottom half in the other. Results of the estimation of equation (10) are shown in Table XX. I find no relation between lagged momentum portfolio returns. This result suggests that mutual fund managers do not engage in momentum trading.

F. Change in Holdings and Fund Performance

Equation (11) investigates whether changes in holdings has an effect on quarterly real estate mutual fund returns. The natural logarithm of fund size, measured by total fund NAV, is used as a control variable. Table XXI is used to show the results. Portfolios are created using the same parameters used in Table XX. I find no evidence of a relationship between lagged momentum-based change in mutual fund holdings and mutual fund returns. The size coefficient is negative and significant, consistent with the expected relationship between security size and returns.

CHAPTER 5
CONCLUSION

This dissertation, as evidenced by the title, looks at the underlying assets held by two distinct real estate related investment opportunities: REITs and real estate mutual funds. I also look at how the holdings affect and are affected by the performance of the asset.

I look at REIT property acquisitions and dispositions over a twelve year period (1994 to 2005) and test for information effects. Abnormal returns are calculated using four proxies for the market return: the daily NYSE/AMEX/Nasdaq equal-weighted return, the daily NYSE/AMEX/Nasdaq value-weighted return, the daily composite equity REIT equal-weighted return, and the daily composite equity REIT value-weighted return. I study daily event windows before and after the announcement of a property acquisition or disposition of [-1, +1], [0], [0, +1], and [-1, +10]. I test for information effects of 13,091 property acquisitions and 1,454 property dispositions. I look at the entire sample, property acquisitions only and property dispositions only. I find evidence of information effects over the entire sample on the day of announcement using the NYSE/AMEX/Nasdaq equal-weighted market return measure (average abnormal return of around 0.09%) and the twelve day event window when the daily composite equity REIT value-weighted measure is used (average abnormal return of around -0.025%). The negative abnormal return suggests an initial positive market reaction on the announcement date then a drift to negative abnormal returns. I look at a sample of only property acquisitions and find evidence of average abnormal returns of around -0.03% over the twelve day event window and 0.09% on the announcement date. There is evidence of information effects with the property disposition sample around the three day and twelve day announcement windows. Dispositions are subject to a much stronger market reaction.

Dividends can be interpreted as holdings which are distributed to the stockholders on a quarterly basis. I test for information effects of a sample of 5,952 dividend

declaration announcements over the 1994 to 2005 sample period. I find significant information effects around all four announcement windows; positive abnormal returns are present. Continued dividend payouts are perceived positively by the market. I test for information effects of dividend announcements that occur before earnings announcements and after earnings announcements. I find significant information effects on the day of dividend announcements which occur before the earnings announcements. The positive abnormal returns were higher than the overall sample. Positive abnormal returns exist across all four announcement windows when dividend announcements occur after earnings announcements. The positive abnormal returns are lower than the overall sample. Dividend announcements made prior to earnings announcements have stronger, more immediate effects.

I look at real estate mutual funds and how managers change holdings of REITs which are the underlying assets. I test for a relationship that liquidity, lagged market-adjusted returns, and dividend policy have on the change in holdings. The entire sample shows a strong effect of liquidity on the change in holdings. When the quarterly composite equity REIT returns are used as a market proxy, the market adjusted returns have a significant positive effect on the change in holdings. REITs that are initially added (entry) or completely removed (exit) by the fund manager can offer misleading results when he holding relationship is examined. When the aforementioned REITs are removed from the sample I find a stronger contribution of liquidity and market-adjusted returns to the change in holdings. The analysis of entry and exit REITs (together, then separately) produces surprising results. Market-adjusted returns of entry REITs have an inverse relationship with the change in holdings; as securities are added to the portfolio, the percent holdings of the existing holdings decrease. In addition, positive and negative changes in dividend policy have a significant influence on the change in holdings. The exit REIT sample produces significant results with market-adjusted returns, liquidity and negative dividend policy.

There are four distinct economic periods in my sample that are studied in the dissertation. There is no significant relationship by market-adjusted returns, liquidity and dividend policy with the change in holdings during the REIT IPO/pre-tech bubble period

of 1/1/1994 to 12/31/1997. Market-adjusted returns have a significant relationship with the change in holdings during the tech bubble period of 1/1/1998 to 3/31/2000. The bubble crash period from 4/1/2000 to 9/30/2002 was a favorable one for real estate related assets, which is evidenced by the results in the dissertation. There is a significant relationship by market-adjusted returns, liquidity and positive changes in dividend policy with the change in holdings. I find a significant relationship by market-adjusted returns and liquidity with the change in holdings during the post-crash period of 10/1/2002 and 12/31/2005. This relationship will likely hold until the end of the real estate bubble.

I look at ex-post performance measures based on earnings per share (EPS) and funds from operations (FFO) to determine if excess returns, liquidity and dividend policy affect the change in holdings. Earnings-based excess returns and liquidity have a significant relationship with the change in holdings over the entire sample. When the subset samples are tested no significant relationships are found. FFO-based excess returns and liquidity have a significant relationship with the change of holdings over the entire sample and the sample that excludes entry and exit REITs. Liquidity has a significant relationship with the change in holdings across the exit REIT sample. The relationship using FFO-based returns are stronger, consistent with the use of FFO as an industry measure.

The limited amount of equity REITs that can exist in a real estate portfolio may not be subject to momentum-based trading, although herding is possible. Momentum portfolios are formed based on lagged returns of one to four quarters prior to portfolio formation and held for four quarters. Winner and loser portfolios are based on the top and bottom third of REIT quarterly returns for one test, and the top and bottom half of REIT quarterly returns for the other. I determine if lagged momentum returns affect the change in holdings of REITs in the winner and loser portfolio, respectively. There is no evidence of a relationship between lagged momentum returns and the change in holdings.

The change in holdings of REITs in real estate mutual funds may have an effect on fund returns. After controlling for size of the fund by using a log transformation of

total fund net asset value, I find no evidence of a relationship between the change in holdings and fund returns.

Overall, the income producing property that is part of a REIT portfolio has an effect on REIT performance. The information effect from property sold by a REIT has an abnormal return component on the day of announcement that can be exploited by investors. Lagged market-adjusted returns of REITs influence a fund manager's decision to change holdings in the real estate mutual fund; the liquidity of the REIT also contributes to change in holdings. Performance based on an ex-post measure such as FFO can influence the change in holdings. The real estate mutual funds and REITs are best served as a defensive or diversifying investment opportunity. Momentum trading strategies do not influence the change in holdings or fund returns.

The findings from this dissertation can be applied to other investment company applications such as other specialty funds, all mutual funds, annuities and pension funds. With specialty funds I would test for relationships within each sector, across sectors, and similar average betas. It would be interesting if the relationship of market-adjusted returns and liquidity with the change in holdings applies across all mutual funds; this produces a more heterogeneous sample. Funds which trade continuously such as closed end funds and exchange traded funds (ETFs) can offer different results due to increased liquidity. I would also look at momentum in the funds. I plan on investigating these ideas in future research.

Table I
Descriptive Statistics

Quarterly results of REITs residing in real estate mutual funds are shown. In Panel A, Market capitalization and return figures are obtained from CRSP. Average return represents all equity REIT returns. Market-adjusted return is $(R_i - R_m)$, where R_m is the CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly return. Average price per share covers all equity REITs. Average percentage holding is the percentage value of a REIT relative to total assets held by a real estate mutual fund. In Panel B, average NAV represents the net asset value per share of all real estate mutual funds. Average returns represent quarterly returns of mutual funds taken from Morningstar Principia database.

Panel A: REITs in Mutual Funds

Period End	Number of REITs	Average Market Capitalization	Average Return	Average Market-Adjusted Return	Average Price	Average Percent Holding
Mar-94	86	$1,317,947,791	2.86%	3.76%	$19.11	1.58
Jun-94	94	$1,180,901,484	3.46%	7.49%	$18.69	1.68
Sep-94	99	$1,157,979,153	0.42%	-5.41%	$17.88	1.78
Dec-94	101	$1,180,390,825	-2.07%	3.60%	$16.98	1.75
Mar-95	101	$1,237,791,949	3.47%	-4.30%	$17.12	1.74
Jun-95	103	$1,275,416,176	5.77%	-4.24%	$17.42	1.74
Sep-95	104	$1,412,831,783	5.68%	-6.04%	$18.14	1.68
Dec-95	104	$1,564,046,436	3.98%	5.65%	$19.24	1.74
Mar-96	105	$1,658,976,007	6.03%	-3.35%	$19.87	1.68
Jun-96	106	$1,809,267,493	3.46%	-5.36%	$19.04	1.58
Sep-96	107	$1,902,254,416	6.77%	7.76%	$20.91	1.68
Dec-96	111	$2,065,107,211	15.67%	15.41%	$24.24	1.88
Mar-97	112	$2,090,325,219	1.67%	1.57%	$23.55	1.87
Jun-97	116	$2,521,191,615	5.99%	-4.77%	$24.57	1.74
Sep-97	119	$2,697,372,543	11.54%	-5.04%	$26.17	1.74
Dec-97	123	$2,811,799,807	1.69%	8.70%	$26.16	1.68
Mar-98	126	$3,197,274,770	1.74%	-10.98%	$23.81	1.58
Jun-98	129	$3,245,448,482	-5.06%	-0.17%	$23.97	1.68
Sep-98	130	$2,844,987,250	-7.02%	13.18%	$20.78	1.78
Dec-98	130	$3,431,663,840	-0.63%	-14.41%	$20.75	1.75
Mar-99	131	$3,589,434,440	-4.78%	-6.62%	$18.93	1.86
Jun-99	132	$3,717,541,800	12.44%	-2.09%	$21.04	1.89
Sep-99	132	$3,774,361,798	-7.25%	-3.60%	$19.25	1.91
Dec-99	133	$4,630,703,369	-1.64%	-19.89%	$18.88	1.93
Mar-00	133	$4,675,051,695	2.66%	-15.01%	$18.64	2.04
Jun-00	134	$4,813,126,958	8.70%	15.97%	$19.08	2.10
Sep-00	134	$5,213,872,399	7.23%	7.52%	$19.66	2.12
Dec-00	134	$4,531,109,477	2.41%	20.72%	$20.34	2.18
Mar-01	134	$4,077,405,753	5.88%	0.75%	$20.14	2.08
Jun-01	134	$4,692,404,871	12.02%	-3.21%	$22.15	2.08

Table I (continued)

Panel A: REITs in Mutual Funds (continued)

Period End	Number of REITs	Average Market Capitalization	Average Return	Average Market-Adjusted Return	Average Price	Average Percent Holdings
Jun-02	134	$3,410,888,797	4.88%	13.36%	$23.99	2.17
Sep-02	136	$2,915,961,186	-8.60%	9.18%	$22.21	2.18
Dec-02	138	$2,862,918,753	-0.12%	-12.00%	$21.35	2.08
Mar-03	140	$2,929,639,319	0.64%	1.26%	$20.94	2.09
Jun-03	140	$3,265,863,699	15.62%	-15.44%	$23.40	2.12
Sep-03	143	$3,698,554,650	9.50%	-4.52%	$25.03	2.03
Dec-03	145	$3,644,800,098	10.71%	-5.88%	$26.78	2.12
Mar-04	147	$3,784,542,155	10.28%	1.56%	$29.17	2.18
Jun-04	150	$3,867,223,116	-5.44%	-3.51%	$26.76	2.08
Sep-04	154	$3,967,817,689	7.53%	9.14%	$28.17	2.02
Dec-04	164	$4,180,704,429	13.67%	-2.41%	$30.36	2.12
Mar-05	168	$4,377,971,678	-5.76%	-0.92%	$27.40	2.10
Jun-05	170	$4,532,981,736	11.60%	9.37%	$29.03	2.02
Sep-05	172	$4,765,342,871	2.27%	-3.49%	$31.78	2.08
Dec-05	174	$5,268,134,275	0.97%	0.20%	$32.17	2.23

Table I (continued)

Panel B: Real Estate Mutual Funds						
Period End		Number of Funds		Average NAV		Average Return (%)
Mar-94		34		12.31		2.74
Jun-94		35		13.98		11.23
Sep-94		35		14.12		5.17
Dec-94		35		14.34		1.83
Mar-95		43		13.98		-3.20
Jun-95		44		14.58		4.30
Sep-95		44		15.01		3.20
Dec-95		46		14.77		-2.40
Mar-96		46		14.55		-1.40
Jun-96		46		14.79		1.40
Sep-96		46		13.04		-12.50
Dec-96		47		15.12		16.04
Mar-97		50		15.75		2.06
Jun-97		62		16.22		1.23
Sep-97		54		18.57		14.14
Dec-97		62		16.22		1.13
Mar-98		69		16.04		-0.08
Jun-98		85		14.17		-5.08
Sep-98		97		12.18		-12.44
Dec-98		102		11.61		-0.60
Mar-99		113		10.77		-4.67
Jun-99		118		11.87		11.61
Sep-99		122		10.16		-9.26
Dec-99		122		10.42		0.02
Mar-00		126		10.94		2.19
Jun-00		125		11.66		10.86
Sep-00		130		12.59		6.95
Dec-00		135		13.52		3.03
Mar-01		146		13.22		-1.56
Jun-01		137		14.61		9.70
Sep-01		131		14.10		-3.10
Dec-01		140		14.52		4.71
Mar-02		147		15.73		7.91

Table I (continued)

Panel B: Real Estate Mutual Funds (continued)

Period End	Number of Funds	Average NAV	Average Return (%)
Jun-02	146	15.97	4.74
Sep-02	148	14.35	-8.92
Dec-02	143	14.18	0.56
Mar-03	155	14.10	1.40
Jun-03	160	15.93	12.56
Sep-03	166	16.91	9.27
Dec-03	169	22.58	2.69
Mar-04	188	22.92	2.68
Jun-04	198	19.70	-5.54
Sep-04	212	22.63	2.66
Dec-04	219	23.69	16.12
Mar-05	219	23.41	9.37
Jun-05	218	23.12	2.62
Sep-05	220	23.02	2.63
Dec-05	259	22.89	2.60

Table II

Performance Around Property Acquisitions/Dispositions

The average abnormal return performance on event windows around property acquisition and disposition announcements from 1994 to 2005 (t-statistics are shown, probability < |t| in parenthesis). The column labeled 'EW' uses the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. The column labeled 'VW' uses the NYSE/AMEX/Nasdaq value-weighted return as a market proxy. The column labeled 'REIT EW' uses a composite equal-weighted return of equity REITs as a market proxy. The column labeled 'REIT VW' uses a composite value-weighted return of equity REITs as a market proxy.

Event Window	EW	VW	REIT EW	REIT VW
[-1, +1]	0.00033	-0.00025	0.00026	0.00026
	1.13120	0.84897	0.92571	0.89823
	(0.2580)	(0.3960)	(0.3547)	(0.3691)
[0, +1]	0.00029	-0.00072	0.00056	0.00047
	0.86191	0.64609	1.54754	1.26431
	(0.3888)	(0.5182)	(0.1219)	(0.2062)
[0]	0.00084	0.00069	0.00063	0.00062
	*1.74354	1.42254	1.34216	1.27603
	(0.0815)	(0.1551)	(0.1798)	(0.2041)
[-1, +10]	-0.00015	-0.00021	-0.00008	-0.00024
	-1.13667	-1.63034	-0.58729	*-1.76811
	(0.2557)	(0.1031)	(0.5570)	(0.0771)

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table III

Performance Around Property Acquisitions

The average abnormal return performance on event windows around property acquisition announcements from 1994 to 2005 (t-statistics are shown, probability < |t| in parenthesis). The column labeled 'EW' uses the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. The column labeled 'VW' uses the NYSE/AMEX/Nasdaq value-weighted return as a market proxy. The column labeled 'REIT EW' uses a composite equal-weighted return of equity REITs as a market proxy. The column labeled 'REIT VW' uses a composite value-weighted return of equity REITs as a market proxy.

Event Window	EW	VW	REIT EW	REIT VW
[-1, +1]	0.00012	-0.00002	0.00002	-0.00002
	0.43105	-0.05911	0.07699	-0.05580
	(0.6665)	(0.9529)	(0.9386)	(0.9555)
[0, +1]	0.00023	0.00009	0.00032	0.00017
	0.65800	0.24510	0.94951	0.47907
	(0.5106)	(0.8064)	(0.3425)	(0.6319)
[0]	0.00093	0.00067	0.00067	0.00059
	*1.87659	1.33604	1.37668	1.15486
	(0.0608)	(0.1818)	(0.1689)	(0.2484)
[-1, +10]	-0.00025	-0.00035	-0.00016	-0.00038
	*-1.90328	***-2.62839	-1.19867	***-2.74072
	(0.0570)	(0.0086)	(0.2307)	(0.0061)

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table IV

Performance Around Property Dispositions

The average abnormal return performance on event windows around property disposition announcements from 1994 to 2005 (t-statistics are shown, probability < |t| in parenthesis). The column labeled 'EW' uses the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. The column labeled 'VW' uses the NYSE/AMEX/Nasdaq value-weighted return as a market proxy. The column labeled 'REIT EW' uses a composite equal-weighted return of equity REITs as a market proxy. The column labeled 'REIT VW' uses a composite value-weighted return of equity REITs as a market proxy.

	EW	VW	REIT EW	REIT VW
[-1, +1]	0.00195	0.00235	0.00218	0.00248
	1.51847	*1.81178	*1.72370	*1.91834
	(0.1296)	(0.0707)	(0.0855)	(0.0557)
[0, +1]	0.00078	0.00129	0.00105	0.00286
	0.65899	1.08336	0.93169	1.61240
	(0.5104)	(0.2796)	(0.3523)	(0.1080)
[0]	0.00021	0.00094	0.00032	0.00062
	0.11529	0.52716	0.18984	1.27603
	(0.9084)	(0.5989)	(0.8497)	(0.2041)
[-1, +10]	0.00054	0.00087	0.00057	0.00086
	1.03676	*1.65520	1.04868	1.53942
	(0.3000)	(0.0981)	(0.2945)	(0.1239)

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table V

Performance Around Dividend Announcements

The average abnormal return performance on event windows around 5,952 dividend declaration dates of equity REITs from 1994 to 2005 (t-statistics are shown, probability < |t| in parenthesis). The column labeled 'EW' uses the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. The column labeled 'VW' uses the NYSE/AMEX/Nasdaq value-weighted return as a market proxy. The column labeled 'REIT EW' uses a composite equal-weighted return of equity REITs as a market proxy. The column labeled 'REIT VW' uses a composite value-weighted return of equity REITs as a market proxy.

	EW	VW	REIT EW	REIT VW
[-1, +1]	0.00098	0.00083	0.00070	0.00065
	***6.83715	***5.82263	***3.92043	***4.43342
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
[0, +1]	0.00144	0.00132	0.00127	0.00114
	***8.07044	***7.39469	***6.88024	***6.16600
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
[0]	0.00146	0.00133	0.00129	0.00114
	***5.72861	***5.23003	***4.69931	***4.47955
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
[-1, +10]	0.00066	0.00058	0.00039	0.00048
	***9.67998	***8.57905	***4.49403	***6.88852
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table V I

Performance Around Dividend Announcements Made Before Earnings Announcements

The average abnormal return performance on event windows around 1,171 equity REIT dividend declaration announcements from 1994 to 2005 (t-statistics are shown, probability < |t| in parenthesis). The dividend announcements are made before the earnings announcements. The column labeled 'EW' uses the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. The column labeled 'VW' uses the NYSE/AMEX/Nasdaq value-weighted return as a market proxy. The column labeled 'REIT EW' uses a composite equal-weighted return of equity REITs as a market proxy. The column labeled 'REIT VW' uses a composite value-weighted return of equity REITs as a market proxy.

	EW	VW	REIT EW	REIT VW
[-1, +1]	0.00088	0.00075	0.00087	0.00063
	***2.99439	**2.54036	***3.11913	**2.12777
	(0.0028)	(0.0111)	(0.0018)	(0.0334)
[0, +1]	0.00138	0.00121	0.00136	0.00128
	***3.67461	***3.20838	***3.79113	***3.00431
	(0.0002)	(0.0014)	(0.0002)	(0.0027)
[0]	0.00152	0.00135	0.00158	0.00128
	***3.20755	***2.83102	***3.48358	***2.66598
	(0.0014)	(0.0047)	(0.0004)	(0.0078)
[-1, +10]	0.00042	0.00033	0.00036	0.00029
	***2.95237	**2.31056	***2.67860	**2.02878
	(0.0032)	(0.0209)	(0.0074)	(0.0425)

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table VII

Performance Around Dividend Announcements Made After Earnings Announcements

The average abnormal return performance on event windows around 3,252 equity REIT dividend declaration announcements from 1994 to 2005 (t-statistics are shown, probability < |t| in parenthesis). The dividend announcements are made after the earnings announcements. The column labeled 'EW' uses the NYSE/AMEX/Nasdaq equal-weighted return as a market proxy. The column labeled 'VW' uses the NYSE/AMEX/Nasdaq value-weighted return as a market proxy. The column labeled 'REIT EW' uses a composite equal-weighted return of equity REITs as a market proxy. The column labeled 'REIT VW' uses a composite value-weighted return of equity REITs as a market proxy.

	EW	VW	REIT EW	REIT VW
[-1, +1]	0.00084	0.00067	0.00044	0.00045
	***4.85046	***3.92989	*1.66414	**2.47703
	(<0.0001)	(<0.0001)	(0.0961)	(0.0133)
[0, +1]	0.00126	0.00110	0.00099	0.00085
	***5.83624	***5.16093	***4.20445	***3.70663
	(<0.0001)	(<0.0001)	(<0.0001)	(0.0002)
[0]	0.00079	0.00066	0.00059	0.00046
	**2.55900	**2.13721	1.56650	1.45960
	(0.0105)	(0.0327)	(0.1173)	(0.1445)
[-1, +10]	0.00079	0.00069	0.00032	0.00053
	***9.48865	***8.37879	**2.50640	***6.03260
	(<0.0001)	(<0.0001)	(0.0122)	(<0.0001)

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table VIII

Prior REIT Performance and Change in Mutual Fund Holdings

The change in quarterly mutual fund holdings is the result of the following relationship:

$$\Delta Hld_{it} = \alpha_{0i}+\beta_{1i}(R_{it-1} - R_{mt-1})+\beta_{2i}LIQ_{it-1}+\beta_{3i}PD_{it-1}+\beta_{4i}ND_{it-1}+\varepsilon_{it};$$

where R_{it-1} = return of stock *i* for quarter *t-1*, R_{mt-1} = return on a market index portfolio for quarter *t-1*, LIQ_{it-1} = a liquidity measure (returns) that is a function of bid-ask spread and turnover, PD_{it-1} = a dummy variable for a positive change in dividend policy, ND_{it-1} = a dummy variable for a negative change in dividend policy and ΔHld_{it} = change in percentage holdings of stock *i* from quarter *t-1* to quarter *t*. The CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly returns serve as the market proxy in Panel A; the Composite equal-weighted equity REIT quarterly returns serve as the market proxy in Panel B. The CRSP NYSE/AMEX/Nasdaq value-weighted portfolio quarterly returns serve as the market proxy in Panel C; the Composite value-weighted equity REIT quarterly returns serve as the market proxy in Panel D.

Panel A: NYSE/AMEX/Nasdaq Equal-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.3254	***3.38	0.0007
$R_{it-1} - R_{mt-1}$	0.1535	1.02	0.3086
LIQ_{it-1}	0.4567	***3.25	0.0011
PD_{it-1}	0.0054	-0.18	0.8546
ND_{it-1}	0.0474	0.61	0.5432
Panel B: Composite Equal-Weighted Equity REIT Returns as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.3231	***3.37	0.0008
$R_{it-1} - R_{mt-1}$	0.2345	1.40	0.1628
LIQ_{it-1}	0.4604	***3.28	0.0010
PD_{it-1}	-0.0064	-0.22	0.8546
ND_{it-1}	0.0503	0.65	0.5187

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table VIII (continued)

Panel C: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.3323	***3.46	0.0005
$R_{it-1} - R_{mt-1}$	0.3087	**2.06	0.0392
LIQ_{it-1}	0.4869	***3.44	0.0006
PD_{it-1}	0.0072	-0.24	0.8086
ND_{it-1}	0.0578	0.74	0.4587
Panel D: Composite Value-Weighted Equity REIT Returns as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.3352	***3.48	0.0005
$R_{it-1} - R_{mt-1}$	0.2859	*1.90	0.0572
LIQ_{it-1}	0.4820	***3.41	0.0006
PD_{it-1}	-0.0068	-0.23	0.8173
ND_{it-1}	0.0556	0.71	0.4758

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table IX

Prior REIT Performance and Change in Mutual Fund Holdings

The correlation of variables used in the regression:

$$\Delta Hld_{it} = \alpha_{0i}+\beta_{1i}(R_{it-1} - R_{mt-1})+\beta_{2i}LIQ_{it-1}+\beta_{3i}PD_{it-1}+\beta_{4i}ND_{it-1}+\varepsilon_{it};$$

is shown below. ΔHld_{it} represents quarterly change in percent REITs held by mutual funds, $(R_{it-1} - R_{mt-1})$ represents lagged market-adjusted returns on the NYSE/AMEX/Nasdaq value-weighted portfolio, LIQ_{it-1} represents the lagged liquidity measure, PD_{it-1} and ND_{it-1} represent the lagged dummy variables for positive and negative changes in dividend policy, respectively.

Correlation Table

	ΔHld_{it}	$(R_{it-1} - R_{mt-1})$	LIQ_{it-1}	PD_{it-1}	ND_{it-1}
ΔHld_{it}	1.00000	0.01289	0.02515	0.00183	0.00166
$(R_{it-1} - R_{mt-1})$	0.01289	1.00000	0.03767	0.04922	-0.09908
LIQ_{it-1}	0.02515	0.03767	1.00000	0.00251	-0.00075
PD_{it-1}	0.00183	0.04922	0.00251	1.00000	-0.12655
ND_{it-1}	0.00166	-0.09908	-0.00075	-0.12655	1.00000

Table X

Prior REIT Performance and Change in Mutual Fund Holdings (No Entry and Exit REITs)

The change in quarterly mutual fund holdings is the result of the following relationship:

$$\Delta Hld_{it} = \alpha_{0i}+\beta_{1i}(R_{it-1} - R_{mt-1})+\beta_{2i}LIQ_{it-1}+\beta_{3i}PD_{it-1}+\beta_{4i}ND_{it-1}+\varepsilon_{it};$$

where R_{it-1} = return of stock *i* for quarter *t-1*, R_{mt-1} = return on a market index portfolio (CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly returns) for quarter *t-1*, LIQ_{it-1} = a liquidity measure that is a function bid-ask spread and turnover, PD_{it-1} = a dummy variable for a positive change in dividend policy, ND_{it-1} = a dummy variable for a negative change in dividend policy and ΔHld_{it} = change in percentage holdings of stock *i* from quarter *t-1* to quarter *t*. I analyze the effects of REITs initially entering and completely exiting the mutual fund portfolio. If $(Hld_{it} - Hld_{it-1}) = Hld_{it}$, the REIT is in an entry position. If $(Hld_{it} - Hld_{it-1}) = -Hld_{it-1}$, the REIT is in an exit position. This table looks at the sample when entry and exit REITs are excluded. The CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly returns serve as the market proxy in Panel A; the CRSP NYSE/AMEX/Nasdaq value-weighted portfolio quarterly returns serve as the market proxy in Panel B. The Composite equity REIT equal-weighted portfolio quarterly returns serve as the market proxy in Panel C; the Composite equity REIT value-weighted portfolio quarterly returns serve as the market proxy in Panel D.

Panel A: NYSE/AMEX/Nasdaq Equal-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.1467	1.60	0.1109
$R_{it-1} - R_{mt-1}$	0.2255	1.57	0.1169
LIQ_{it-1}	0.3199	**2.39	0.0171
PD_{it-1}	0.0111	0.40	0.6907
ND_{it-1}	0.0453	0.61	0.5409
Panel B: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.1526	*1.66	0.0962
$R_{it-1} - R_{mt-1}$	0.4163	***2.91	0.0036
LIQ_{it-1}	0.3559	**2.64	0.0083
PD_{it-1}	0.0875	0.31	0.7537
ND_{it-1}	0.0580	0.78	0.4336

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table X (continued)

Panel C: Composite Equal-Weighted Equity REIT Returns as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.1415	1.52	0.1225
$R_{it-1} - R_{mt-1}$	0.2892	*1.80	0.0718
LIQ_{it-1}	0.3216	**2.40	0.0165
PD_{it-1}	0.0104	0.37	0.7099
ND_{it-1}	0.0467	0.63	0.5282
Panel D: Composite Value-Weighted Equity REIT Returns as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.1573	*1.71	0.0872
$R_{it-1} - R_{mt-1}$	0.3906	***2.72	0.0065
LIQ_{it-1}	0.3507	***2.60	0.0093
PD_{it-1}	0.0097	0.33	0.7425
ND_{it-1}	0.0552	0.75	0.4557

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XI

Prior REIT Performance and Change in Mutual Fund Holdings (Entry and Exit REITs Only)

The change in quarterly mutual fund holdings is the result of the following relationship:

$$\Delta Hld_{it} = \alpha_{0i}+\beta_{1i}(R_{it-1} - R_{mt-1})+\beta_{2i}LIQ_{it-1}+\beta_{3i}PD_{it-1}+\beta_{4i}ND_{it-1}+\varepsilon_{it};$$

where R_{it-1} = return of stock *i* for quarter *t-1*, R_{mt-1} = return on a market index portfolio (CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly returns) for quarter *t-1*, LIQ_{it-1} = a liquidity measure that is a function bid-ask spread and turnover, PD_{it-1} = a dummy variable for a positive change in dividend policy, ND_{it-1} = a dummy variable for a negative change in dividend policy and ΔHld_{it} = change in percentage holdings of stock *i* from quarter *t-1* to quarter *t*. I analyze the effects of REITs initially entering and completely exiting the mutual fund portfolio. If $(Hld_{it} - Hld_{it-1}) = Hld_{it}$, the REIT is in an entry position. If $(Hld_{it} - Hld_{it-1}) = -Hld_{it-1}$, the REIT is in an exit position. This table looks at the sample of only entry and exit REITs . The CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly returns serve as the market proxy in Panel A; the CRSP NYSE/AMEX/Nasdaq value-weighted portfolio quarterly returns serve as the market proxy in Panel B. The quarterly Composite equity REITequal-weighted returns serve as the market proxy in Panel C; the quarterly Composite equity REITvalue-weighted returns serve as the market proxy in Panel D.

Panel A: NYSE/AMEX/Nasdaq Equal-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	1.5291	***4.06	<0.0001
$R_{it-1} - R_{mt-1}$	-0.9829	*-1.68	0.0930
LIQ_{it-1}	1.1537	**2.10	0.0358
PD_{it-1}	-0.2016	-1.57	0.1164
ND_{it-1}	-0.0215	-0.06	0.9485
Panel B: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-stat	Probability < t
intercept	1.5319	***4.04	<0.0001
$R_{it-1} - R_{mt-1}$	-0.7792	-1.36	0.1754
LIQ_{it-1}	1.1065	*1.97	0.0489
PD_{it-1}	-0.2003	-1.56	0.1188
ND_{it-1}	-0.0194	-0.06	0.9535

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XI (continued)

Panel C: Composite Equal-Weighted Equity REIT Returns as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	1.5630	***4.16	<0.0001
$R_{it-1} - R_{mt-1}$	-0.8834	-1.38	0.1674
LIQ_{it-1}	1.1745	**2.14	0.0329
PD_{it-1}	-0.1982	-1.55	0.1226
ND_{it-1}	-0.0154	-0.05	0.9630
Panel D: Composite Value-Weighted Equity REIT Returns as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	1.5860	***4.00	<0.0001
$R_{it-1} - R_{mt-1}$	-0.8573	-1.49	0.1376
LIQ_{it-1}	1.1028	**1.97	0.0486
PD_{it-1}	-0.2013	-1.57	0.1170
ND_{it-1}	-0.0251	-0.08	0.9399

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XII

Prior REIT Performance and Change in Mutual Fund Holdings (Entry REITs Only)

The change in quarterly mutual fund holdings is the result of the following relationship:

$$\Delta Hld_{it} = \alpha_{0i}+\beta_{1i}(R_{it-1} - R_{mt-1})+\beta_{2i}LIQ_{it-1}+\beta_{3i}PD_{it-1}+\beta_{4i}ND_{it-1}+\varepsilon_{it};$$

where R_{it-1} = return of stock *i* for quarter *t-1*, R_{mt-1} = return on a market index portfolio (CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly returns) for quarter *t-1*, LIQ_{it-1} = a liquidity measure that is a function bid-ask spread and turnover, PD_{it-1} = a dummy variable for a positive change in dividend policy, ND_{it-1} = a dummy variable for a negative change in dividend policy and ΔHld_{it} = change in percentage holdings of stock *i* from quarter *t-1* to quarter *t*. I analyze the effects of REITs initially entering and completely exiting the mutual fund portfolio. If $(Hld_{it} - Hld_{it-1}) = Hld_{it}$, the REIT is in an entry position. If $(Hld_{it} - Hld_{it-1}) = -Hld_{it-1}$, the REIT is in an exit position. This table looks at the sample of only entry REITs. The CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly returns serve as the market proxy in Panel A; the CRSP NYSE/AMEX/Nasdaq value-weighted portfolio quarterly returns serve as the market proxy in Panel B. The quarterly Composite equity REIT equal-weighted returns serve as the market proxy in Panel C; the quarterly Composite equity REIT value-weighted returns serve as the market proxy in Panel D.

Panel A: NYSE/AMEX/Nasdaq Equal-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	1.5583	***4.03	<0.0001
$R_{it-1} - R_{mt-1}$	-2.2819	***-3.58	0.0004
LIQ_{it-1}	-0.3157	-0.56	0.5790
PD_{it-1}	-0.2654	**-1.97	0.0491
ND_{it-1}	-0.5629	*-1.71	0.0877
Panel B: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	1.5993	***4.09	<0.0001
$R_{it-1} - R_{mt-1}$	-1.5589	**-2.49	0.0131
LIQ_{it-1}	-0.3607	-0.62	0.5385
PD_{it-1}	-0.2647	**-1.99	0.0473
ND_{it-1}	-0.5549	*-1.67	0.0945

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XII (continued)

Panel C: Composite Equal-Weighted Equity REIT Returns as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	1.6271	***4.23	<0.0001
$R_{it-1} - R_{mt-1}$	-2.3726	***-3.40	0.0007
LIQ_{it-1}	-0.2955	**-2.21	0.0272
PD_{it-1}	-0.2538	*-1.88	0.0603
ND_{it-1}	-0.5623	*-1.71	0.0884
Panel D: Composite Value-Weighted Equity REIT Returns as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	1.5714	***4.02	<0.0001
$R_{it-1} - R_{mt-1}$	-1.7234	***-2.77	0.0058
LIQ_{it-1}	-0.3694	-0.63	0.5256
PD_{it-1}	-0.2692	**-1.99	0.0467
ND_{it-1}	-0.5569	*-1.68	0.0927

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XIII

Prior REIT Performance and Change in Mutual Fund Holdings (Exit REITs Only)

The change in quarterly mutual fund holdings is the result of the following relationship:

$$\Delta Hld_{it} = \alpha_{0i}+\beta_{1i}(R_{it-1} - R_{mt-1})+\beta_{2i}LIQ_{it-1}+\beta_{3i}PD_{it-1}+\beta_{4i}ND_{it-1}+\varepsilon_{it};$$

where R_{it-1} = return of stock *i* for quarter *t-1*, R_{mt-1} = return on a market index portfolio (CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly returns) for quarter *t-1*, LIQ_{it-1} = a liquidity measure that is a function bid-ask spread and turnover, PD_{it-1} = a dummy variable for a positive change in dividend policy, ND_{it-1} = a dummy variable for a negative change in dividend policy and ΔHld_{it} = change in percentage holdings of stock *i* from quarter *t-1* to quarter *t*. I analyze the effects of REITs initially entering and completely exiting the mutual fund portfolio. If $(Hld_{it} - Hld_{it-1}) = Hld_{it}$, the REIT is in an entry position. If $(Hld_{it} - Hld_{it-1}) = -Hld_{it-1}$, the REIT is in an exit position. This table looks at the sample of only exit REITs. The CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly returns serve as the market proxy in Panel A; the CRSP NYSE/AMEX/Nasdaq value-weighted portfolio quarterly returns serve as the market proxy in Panel B. The quarterly Composite equity REIT equal-weighted returns serve as the market proxy in Panel C; the quarterly Composite equity REIT value-weighted returns serve as the market proxy in Panel D.

Panel A: NYSE/AMEX/Nasdaq Equal-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.0440	0.10	0.9173
$R_{it-1} - R_{mt-1}$	2.0782	***3.50	0.0005
LIQ_{it-1}	1.6161	***2.66	0.0081
PD_{it-1}	0.0274	0.02	0.9842
ND_{it-1}	0.7070	*1.77	0.0768
Panel B: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.0566	0.13	0.8943
$R_{it-1} - R_{mt-1}$	1.8634	***3.17	0.0017
LIQ_{it-1}	1.7604	***2.85	0.0046
PD_{it-1}	-0.0028	-0.02	0.9838
ND_{it-1}	0.7033	*1.76	0.0797

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XIII (continued)

Panel C: Composite Equal-Weighted Equity REIT Returns as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
Intercept	0.0273	0.06	0.9486
$R_{it-1} - R_{mt-1}$	2.3574	***3.63	0.0003
LIQ_{it-1}	1.6767	***2.76	0.0061
PD_{it-1}	0.0068	0.05	0.9609
ND_{it-1}	0.7503	*1.88	0.0612
Panel D: Composite Value-Weighted Equity REIT Returns as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
Intercept	0.0690	0.16	0.8717
$R_{it-1} - R_{mt-1}$	1.8215	***3.04	0.0025
LIQ_{it-1}	1.7256	***2.80	0.0054
PD_{it-1}	-0.0031	-0.02	0.9825
ND_{it-1}	0.7165	*1.78	0.0754

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XIV

Prior REIT Performance and Change in Mutual Fund Holdings (Economic Sub-Periods)

The change in quarterly mutual fund holdings is the result of the following relationship:

$$\Delta Hld_{it} = \alpha_{0i}+\beta_{1i}(R_{it-1} - R_{mt-1})+\beta_{2i}LIQ_{it-1}+\beta_{3i}PD_{it-1}+\beta_{4i}ND_{it-1}+\varepsilon_{it};$$

where R_{it-1} = return of stock *i* for quarter *t-1*, R_{mt-1} = return on a market index portfolio for quarter *t-1*, LIQ_{it-1} = a liquidity measure (returns) that is a function of bid-ask spread and turnover, PD_{it-1} = a dummy variable for a positive change in dividend policy, ND_{it-1} = a dummy variable for a negative change in dividend policy and ΔHld_{it} = change in percentage holdings of stock *i* from quarter *t-1* to quarter *t*. The CRSP NYSE/AMEX/Nasdaq equal-weighted portfolio quarterly returns serve as the market proxy. Panel A looks at the REIT IPO/pre-tech bubble period; Panel B looks at the tech bubble period. Panel C covers the bubble crash period; Panel D covers the post-crash/recovery period.

Panel A: Pre-Tech Bubble (1/1/94-12/31/97)			
Variable	Coefficient	t-statistic	probability < t
intercept	-0.1867	-0.17	0.8619
$R_{it-1} - R_{mt-1}$	1.3298	1.45	0.1473
LIQ_{it-1}	0.2000	0.08	0.9382
PD_{it-1}	0.2045	1.09	0.2782
ND_{it-1}	0.1633	0.51	0.6108
Panel B: Tech Bubble (1/1/1998-3/31/2000)			
Variable	Coefficient	t-statistic	probability < t
intercept	1.1539	0.43	0.6664
$R_{it-1} - R_{mt-1}$	1.2470	*1.78	0.0752
LIQ_{it-1}	3.0211	0.47	0.6357
PD_{it-1}	0.0072	-0.24	0.8086
ND_{it-1}	0.0578	0.74	0.4587

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XIV (continued)

Panel C: Tech Bubble Crash (4/1/2000-9/30/2002)			
Variable	Coefficient	t-statistic	probability < t
intercept	-2.5849	**-2.18	0.0299
$R_{it-1} - R_{mt-1}$	0.7211	*1.80	0.0723
LIQ_{it-1}	0.4469	*1.95	0.0517
PD_{it-1}	0.3632	***2.62	0.0090
ND_{it-1}	0.0330	0.14	0.8926
Panel D: Post-Tech Bubble Crash (10/1/2002-12/31/2005)			
Variable	Coefficient	t-statistic	probability < t
intercept	0.3254	***3.38	0.0007
$R_{it-1} - R_{mt-1}$	0.2859	*1.90	0.0572
LIQ_{it-1}	0.4604	***3.28	0.0010
PD_{it-1}	-0.2003	-1.56	0.1188
ND_{it-1}	0.0556	0.71	0.4758

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XV

Prior Ex-Post REIT Performance and Change in Mutual Fund Holdings (Earnings Per Share)

The change in quarterly mutual fund holdings is the result of the following ex-post relationship:

$$\Delta Hld_{it} = \alpha_{0i} + \beta_{1i}(EARNP_{it-1} - EARNP_{mt-1}) + \beta_{2i}LIQ_{it-1} + \beta_{3i}PD_{it-1} + \beta_{4i}ND_{it-1} + \varepsilon_{it};$$

where $EARNP_{it-1}$ = percentage increase (decrease) in earnings per share of stock *i* for quarter *t-1*, $EARNP_{mt-1}$ = percentage increase (decrease) on an equal-weighted portfolio of equity REITs for quarter *t-1*, LIQ_{it-1} = a liquidity measure that is a function bid-ask spread and turnover, PD_{it-1} = a dummy variable for a positive change in dividend policy, ND_{it-1} = a dummy variable for a negative change in dividend policy and ΔHld_{it} = change in percentage holdings of stock *i* from quarter *t-1* to quarter *t*. The CRSP NYSE/AMEX/Nasdaq value-weighted portfolio quarterly returns serve as the market proxy.

NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.5950	***5.31	<0.0001
$EARNP_{it-1} - EARNP_{mt-1}$	0.0132	**2.36	0.0183
LIQ_{it-1}	0.8167	***5.01	<0.0001
PD_{it-1}	-0.0301	-0.98	0.3267
ND_{it-1}	-0.0015	-0.02	0.9858

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XVI

Prior REIT Ex-Post Performance and Change in Mutual Fund Holdings (Earnings Per Share)

The change in quarterly mutual fund holdings is the result of the following relationship:

$$\Delta Hld_{it} = \alpha_{0i} + \beta_{1i}(EARNP_{it-1} - EARNP_{mt-1}) + \beta_{2i}LIQ_{it-1} + \beta_{3i}PD_{it-1} + \beta_{4i}ND_{it-1} + \varepsilon_{it};$$

where $EARNP_{it-1}$ = percentage increase (decrease) in earnings per share of stock *i* for quarter *t-1*, $EARNP_{mt-1}$ = percentage increase (decrease) on an equal-weighted portfolio of equity REITs for quarter *t-1*, LIQ_{it-1} = a liquidity measure that is a function bid-ask spread and turnover, PD_{it-1} = a dummy variable for a positive change in dividend policy, ND_{it-1} = a dummy variable for a negative change in dividend policy and ΔHld_{it} = change in percentage holdings of stock *i* from quarter *t-1* to quarter *t*. I analyze the effects of REITs initially entering and completely exiting the mutual fund portfolio. If $(Hld_{it} - Hld_{it-1}) = Hld_{it}$, the REIT is in an entry position. If $(Hld_{it} - Hld_{it-1}) = -Hld_{it-1}$, the REIT is in an exit position. The CRSP NYSE/AMEX/Nasdaq value-weighted portfolio quarterly returns serve as the market proxy. Panel A looks at the entire sample. Panel B looks at the sample without entry and exit REITs. Panel C looks at entry and exit REITs only. Panel D looks at exit REITs only.

Panel A: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Index (All REITs)			
Variable	Coefficient	t-statistic	probability < t
intercept	0.5950	***5.31	<0.0001
$EARNP_{it-1} - EARNP_{mt-1}$	0.0132	**2.36	0.0183
LIQ_{it-1}	0.8167	***5.01	<0.0001
PD_{it-1}	-0.0301	-0.98	0.3267
ND_{it-1}	-0.0015	-0.02	0.9858
Panel B: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Index (No Entry or Exit REITs)			
Variable	Coefficient	t-statistic	probability < t
intercept	-0.2704	*-1.66	0.0967
$EARNP_{it-1} - EARNP_{mt-1}$	0.0032	0.62	0.5366
LIQ_{it-1}	-0.1464	-0.57	0.5708
PD_{it-1}	0.0262	0.34	0.7361
ND_{it-1}	0.0586	0.41	0.6802

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XVI (continued)

Panel C: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Index (Entry and Exit REITs only)			
Variable	Coefficient	t-statistic	probability < t
intercept	0.4740	0.84	0.4028
$EARNP_{it-1}–EARNP_{mt-1}$	-0.0171	-0.32	0.7471
LIQ_{it-1}	-0.3005	-0.32	0.7502
PD_{it-1}	0.0072	-1.06	0.2902
ND_{it-1}	0.1660	0.36	0.7202
Panel D: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Index (Exit REITs only)			
Variable	Coefficient	t-statistic	probability < t
intercept	-0.0211	-0.04	0.9695
$EARNP_{it-1}–EARNP_{mt-1}$	0.2703	0.43	0.5543
LIQ_{it-1}	1.4703	1.64	0.1066
PD_{it-1}	-0.0943	-0.33	0.7412
ND_{it-1}	-0.7689	-1.26	0.2120

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XVII

Prior REIT Performance and Change in Mutual Fund Holdings (FFO)

The change in quarterly mutual fund holdings is the result of the following ex-post relationship:

$$\Delta Hld_{it} = \alpha_{0i} + \beta_{1i}(FFOP_{it-1} - FFOP_{mt-1}) + \beta_{2i}LIQ_{it-1} + \beta_{3i}PD_{it-1} + \beta_{4i}ND_{it-1} + \varepsilon_{it};$$

where $FFOP_{it-1}$ = percentage increase (decrease) in FFO per share of stock *i* for quarter *t-1*, $FFOP_{mt-1}$ = percentage increase (decrease) on an equal-weighted portfolio of equity REITs for quarter *t-1*, LIQ_{it-1} = a liquidity measure that is a function of bid-ask spread and turnover, PD_{it-1} = a dummy variable for a positive change in dividend policy, ND_{it-1} = a dummy variable for a negative change in dividend policy and ΔHld_{it} = change in percentage holdings of stock *i* from quarter *t-1* to quarter *t*. The CRSP NYSE/AMEX/Nasdaq value-weighted portfolio quarterly returns serve as the market proxy.

NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Market Proxy			
Variable	Coefficient	t-statistic	probability < t
intercept	0.5091	***4.49	<0.0001
$FFOP_{it-1} - FFOP_{mt-1}$	0.0017	***2.70	0.0069
LIQ_{it-1}	0.6935	***4.18	<0.0001
PD_{it-1}	-0.0087	-0.28	0.7825
ND_{it-1}	-0.0111	-0.13	0.8951

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XVIII

Prior REIT Performance and Change in Mutual Fund Holdings (FFO)

The change in quarterly mutual fund holdings is the result of the following relationship:

$$\Delta Hld_{it} = \alpha_{0i} + \beta_{1i}(FFOP_{it-1} - FFOP_{mt-1}) + \beta_{2i}LIQ_{it-1} + \beta_{3i}PD_{it-1} + \beta_{4i}ND_{it-1} + \varepsilon_{it};$$

where $FFOP_{it-1}$ = percentage increase (decrease) in FFO per share of stock *i* for quarter *t-1*, $FFOP_{mt-1}$ = percentage increase (decrease) on an equal-weighted portfolio of equity REITs for quarter *t-1*, LIQ_{it-1} = a liquidity measure that is a function bid-ask spread and turnover, PD_{it-1} = a dummy variable for a positive change in dividend policy, ND_{it-1} = a dummy variable for a negative change in dividend policy and ΔHld_{it} = change in percentage holdings of stock *i* from quarter *t-1* to quarter *t*. I analyze the effects of REITs initially entering and completely exiting the mutual fund portfolio. If $(Hld_{it} - Hld_{it-1}) = Hld_{it}$, the REIT is in an entry position. If $(Hld_{it} - Hld_{it-1}) = -Hld_{it-1}$, the REIT is in an exit position. The CRSP NYSE/AMEX/Nasdaq value-weighted portfolio quarterly returns serve as the market proxy. Panel A looks at the entire sample. Panel B looks at the sample without entry and exit REITs. Panel C looks at entry and exit REITs only. Panel D looks at exit REITs only.

Panel A: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Index (All REITs)			
Variable	Coefficient	t-statistic	probability < t
intercept	0.5091	***4.49	<0.0001
$FFOP_{it-1} - FFOP_{mt-1}$	0.0017	***2.70	0.0069
LIQ_{it-1}	0.6935	***4.18	<0.0001
PD_{it-1}	-0.0087	-0.28	0.7825
ND_{it-1}	-0.0111	-0.13	0.8951
Panel B: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Index (No Entry or Exit REITs)			
Variable	Coefficient	t-statistic	probability < t
intercept	-0.0353	-0.18	0.0967
$FFOP_{it-1} - FFOP_{mt-1}$	0.0000	0.03	0.9757
LIQ_{it-1}	0.1689	0.54	0.5887
PD_{it-1}	0.0081	0.10	0.9241
ND_{it-1}	0.0400	0.26	0.7926

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XVIII (continued)

Panel C: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Index (Entry and Exit REITs only)			
Variable	Coefficient	t-statistic	probability < t
intercept	0.6456	1.03	0.3062
$FFOP_{it-1}–FFOP_{mt-1}$	-0.0271	-0.98	0.3300
LIQ_{it-1}	-0.1052	-0.10	0.9193
PD_{it-1}	-0.4187	-1.35	0.1783
ND_{it-1}	0.2554	0.42	0.6777
Panel D: NYSE/AMEX/Nasdaq Value-Weighted Portfolio Return as Index (Exit REITs only)			
Variable	Coefficient	t-statistic	probability < t
intercept	0.2793	0.46	0.6473
$FFOP_{it-1}–FFOP_{mt-1}$	-0.0093	-0.45	0.6531
LIQ_{it-1}	1.8871	*1.93	0.0595
PD_{it-1}	-0.1606	-0.51	0.6091
ND_{it-1}	-0.9362	-1.28	0.2054

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XIX

Momentum and Change in Fund Holdings
Summary Results

Average quarterly winner portfolios (winners), loser portfolios (losers) and zero investment momentum portfolios (W-L) are shown. Portfolios are evaluated using lagged quarterly returns 'f' quarters prior to the formation period, and held 'h' quarters after the formation period (columns labeled [f, h]). Panel A shows the momentum portfolio quarterly returns using the top third of returns as the winner portfolio and the bottom third of returns as the loser portfolio (T33 – B33); Panel B shows the momentum portfolio quarterly returns using the top half of returns as the winner portfolio and the bottom half of returns as the loser portfolio (T50 – B50).

Panel A: T33 - B33 Portfolios				
	[1,4]	[2, 4]	[3, 4]	[4, 4]
Winners	0.041166	0.043210	0.042297	0.042453
t-statistic	***4.40	***4.88	***4.77	***4.61
Losers	0.038371	0.037926	0.035873	0.035137
t-statistic	***4.20	***4.05	***3.75	***3.55
W -L	0.002795	0.005284	0.006424	0.007316
t-statistic	0.82	1.41	1.39	1.36
Panel B: T50 – B50 Portfolios				
	[1,4]	[2, 4]	[3, 4]	[4, 4]
Winners	0.039867	0.041342	0.040906	0.041122
t-statistic	***4.74	***4.76	***4.68	***4.55
Losers	0.038003	0.037578	0.035574	0.036186
t-statistic	***4.33	***4.24	***3.90	***3.88
W -L	0.001864	0.003763	0.005332	0.004937
t-statistic	0.77	1.35	1.55	1.20

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XX

Momentum Portfolios and Change in Fund Holdings

The effect of the momentum portfolio on average change in fund holdings is the result of the following relationship:

$$M\Delta Hld_{jt} = \alpha_0 + \beta_1 \, (\text{W-L})_{t-1} + \varepsilon_t \, ;$$

where: $(\text{W-L})_{t-1}$ = return of the momentum portfolio for quarter *t-1* and $M\Delta Hld_{jt}$ = average change in percentage holdings of stocks in the winner (loser) portfolio for each fund *j* from quarter *t-1* to quarter *t*. Portfolios are evaluated using lagged quarterly returns 'f' quarters prior to the formation period, and held 'h' quarters after the formation period (columns labeled [f, h]). Panel A shows the momentum portfolio quarterly returns using the top third of returns as the winner portfolio and the bottom third of returns as the loser portfolio (T33 – B33); Panel B shows the momentum portfolio quarterly returns using the top half of returns as the winner portfolio and the bottom half of returns as the loser portfolio (T50 – B50).

Panel A: T33 - B33 Portfolio				
	[1, 4]	**[2, 4]**	**[3, 4]**	**[4, 4]**
Intercept	0.27712	0.21119	0.25746	0.21455
t - statistic	***4.30	***2.68	***2.66	**2.12777
	(<0.0001)	(0.0076)	(0.0080)	(0.0334)
$(W - L)_{t-1}$	5.01734	1.03303	2.69473	1.32803
t - statistic	1.20	0.24	0.75	0.36
	(0.2292)	(0.8117)	(0.4558)	(0.7162)
Panel B: T50 – B50 Portfolio				
	[1, 4]	**[2, 4]**	**[3, 4]**	**[4, 4]**
Intercept	0.28532	0.29958	0.25774	0.28734
t - statistic	***5.36	***4.39	***3.26	***3.34
	(<0.0001)	(<0.0001)	(0.0012)	(0.0009)
$(W - L)_{t-1}$	7.09798	1.42329	3.11451	-0.59925
t - statistic	1.45	0.31	0.72	-0.16
	(0.1463)	(0.7579)	(0.4698)	(0.8700)

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

Table XXI

Effect of Mutual Fund Holdings on Fund Performance

The effect of the change in mutual fund holdings on mutual fund performance, after controlling for size of the fund, is the result of the following relationship:

$$R_{jt} = \alpha_o + \beta_1 M\Delta Hld_{jt} + \beta_2 lnSize_{jt} + \varepsilon_{jt};$$

where: R_{jt} = return of fund j at quarter t, $M\Delta Hld_{it}$ = average change in percentage holdings of stocks in fund j from quarter t-1 to quarter t, $lnSize_{jt}$ = size of mutual fund j, measured by ln(NAV) at quarter t. Fama and MacBeth (1973) regressions are used to generate coefficients and t-statistics. Portfolios are evaluated using lagged quarterly returns 'f' quarters prior to the formation period, and held 'h' quarters after the formation period (columns labeled [f, h]. Panel A shows the momentum portfolio quarterly returns using the top third of returns as the winner portfolio and the bottom third of returns as the loser portfolio (T33 – B33); Panel B shows the momentum portfolio quarterly returns using the top half of returns as the winner portfolio and the bottom half of returns as the loser portfolio (T50 – B50).

Panel A: T33 - B33 Portfolio				
	[1, 4]	**[2, 4]**	**[3, 4]**	**[4, 4]**
Intercept	-0.51924	-0.87821	-0.47188	0.29153
t - statistic	-0.19	-0.32	-0.17	0.11
MΔHld	-0.10849	-0.11918	0.07985	0.13250
t - statistic	-0.63	-0.72	0.59	1.20
lnSize	-0.40936	-0.38702	-0.41225	-0.42232
t - statistic	***-2.69	**-2.54	***-2.70	***-2.79
Panel B: T50 – B50 Portfolio				
	[1, 4]	**[2, 4]**	**[3, 4]**	**[4, 4]**
Intercept	-0.39830	-0.60011	-0.51339	-0.28337
t - statistic	-0.15	-0.22	-0.19	-0.10
MΔHld	0.20217	0.09239	0.09579	-0.03994
t - statistic	0.94	0.45	0.66	-0.38
lnSize	-0.41656	-0.40610	-0.40980	-0.42001
t - statistic	***-2.74	***-2.67	***-2.70	***-2.77

* Significance at 10% level
**Significance at 5% level
*** Significance at 1% level

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BIOGRAPHICAL SKETCH

Dr. Price was born and raised in Brooklyn, NY. He earned his baccalaureate degree in civil engineering from Cornell University. He proceeded to apply his education to the workforce, where he spent twenty years in the construction industry, most of it at a Fortune 100 firm in the field of cost and financial analysis of construction projects. In the five years prior to pursuing doctoral studies Dr. Price worked at a non-profit real estate development company, again concentrating on the financial position of projects. While pursuing his degree at Florida State University Dr. Price served on the Executive Committee of the FSU Black Graduate Students Association as Secretary, and the Planning Committee of the PhD Project Finance Doctoral Students Association first as Secretary, then as President. Dr. Price enjoys sports, gospel music and movies. Dr. Price is married and has a wife, Pat and a son, Russell Maurice. Dr. Price resides in Silver Spring, MD and is currently an Assistant Professor at Howard University in Washington DC.