For Presentation at the 2016 Real Estate Research Institute Conference

Asset Growth and Stock Performance: Evidence from REITs

David C Ling*, Joseph T.L. OOI# & Ruoran XU@

April 2016

Abstract

In this paper, we examine the impact of asset growth rates on the future stock performance of 309 publicly traded real estate investment trusts (REITs). We observe that fast growing REITs tend to underperform slow growing REITs. However, we find evidence that the growth effect is significantly less negative for REITs selling at a premium to NAV. Compared to common stocks, the growth effect is weaker in REIT markets due to the constrained environment in which REITs operate. On the asset investment side, the negative asset growth effect is associated with growth in non-core assets. This is consistent with the notion that firms that grow outside of their competency areas are penalized by the market. On the asset financing side, we find that growth activities funded by taking on more unsecured debt are associated with negative stock performance over the next 12 months. This suggests that the provision of collateral associated with secured debt and the refinancing risk associated with debt are effective in restricting firms from engaging in sub-optimal growth.

Keywords: REITs, asset growth, pricing anomaly

We thanks Yi Fan, Andrew McCulloch, Mo Rodriquez, and Ben Scheick for helpful comments and suggestions. We also thank the Real Estate Research Institute for proving partial funding for this research.

---

* David C. Ling, Department of Finance Insurance & Real Estate, Warrington College of Business Administration, University of Florida. e-mail: ling@ufl.edu.

Joseph T.L. Ooi, Department of Real Estate, National University of Singapore. e-mail: rstooitl@nus.edu.sg (contact author).

@ Ruoran Xu, Department of Real Estate, National University of Singapore. e-mail: xuruoran@nus.edu.sg.

Asset Growth and Stock Performance: Evidence from REITs

1.0 Introduction

Existing studies generally find a negative relation between asset growth rates and stock returns [Cooper, Gulen and Schill (CGS, 2008), Fama and French (2006; 2008), and Lipson, Mortal and Schill (LMS, 2011)]. CGS (2008) find that a portfolio of low growth firms outperforms a portfolio of high growth firms over a one-year horizon by 19.5% and 8.4%, respectively, on an equal-weighted and value-weighted basis. Using data on Australian firms, Gray and Johnson (2011) similarly document that low growth firms outperform high growth firms by an average of 13% annually.[1]

The negative impact on stock prices extends to other dimensions of firm expansion, such as growth in capital investment (Anderson and Garcia-Feijóo, 2006; Titman, Wei and Xie, 2004), growth in accruals (Fairfield, Whisenant and Yohn, 2003; Sloan, 1996), growth in net operating assets (Fairfield, Whisenant and Yohn, 2003; Hirshleifer et al., 2004), new share issuance (Pontiff and Woodgate, 2008), and new debt offerings (Spiess and Affleck-Graves, 1999). CGS (2008) and LMS (2011) nevertheless observe that the negative asset growth effect empirically dominates the return destroying effects of these alternative dimensions of firm expansion. Moreover, the asset growth effect dominates other conventional returns determinants, such as firm size, the book-to-market (B/M) ratio, and return momentum in cross-sectional regressions of stock returns (see CGS, 2008).

The negative relation between growth and future stock returns is known as the "asset growth" anomaly in the finance literature; in an efficient capital market, any abnormal returns associated with growth should be eliminated by the trading activities of arbitrageurs. LMS (2011) therefore suggest the presence of significant arbitrage costs as an explanation for the persistence of the asset growth effect over time. Based on the finding that acquiring firms often earn negative abnormal returns surrounding M&A announcements (Loughran and Ritter, 1995; Moeller, Schlingemann and Stulz, 2005), one explanation for the observed negative relationship between asset growth and future stock

[1] Fu (2001) argues that the superior returns of low growth firms and portfolios are due in part to the omission of delisted firms in the CRSP database.

returns is the slow diffusion of information. That is, the negative effect of asset growth is only gradually reflected in the stock price. However, this explanation is not supported by Agrawal, Jaffe and Mandelker's (1992) who find a lack of correlation between short-run and long-run underperformance.

Another explanation suggested by Fama and French (2006) for the long-run underperformance of fast growing firms is that retained earnings are usually reinvested inefficiently, which leads to lower future stock returns. Alternatively, CGS (2008) and LMS (2011) argue that the long-run underperformance of fast growing firms is due to the market correcting investors' over-reaction to past firm performance. In particular, they observed that high (low) growth firms tend to register better (worse) accounting performance prior to the growth incidents. However, subsequent earning announcements for high (low) growth firms are associated with negative (positive) abnormal returns.[2]

Existing studies of the asset growth anomaly exclude financial firms, including Real Estate Investment Trusts (REITs). Although REITs differ from firms in most other industries, these differences present an opportunity to better understand the asset growth anomaly. First, the intrinsic value of an equity REIT is tightly linked to the value of its underlying commercial real estate portfolio. Unlike many less asset-intensive industries, the value of a REIT's business franchise generally plays a minimum role in stock valuation (Green Street Advisors, 2014). Thus, movements in REIT stock prices should be more tightly linked to changes in the asset base than in industries where changes in the market's valuation of the business franchise often impede efforts to detect a pure asset growth effect.

Second, the properties owned and operated by listed equity REITs are acquired and disposed in a "parallel" private market. The availability of pricing data from this extensive parallel market greatly improves the ability of buy-side and sell-side analysts to estimate the net asset value (NAV) of a REIT. This, in turn, means that successful capital allocation should be relatively straight-forward for REITs because they can readily identify when they have a cost of capital advantage or disadvantage (Green Street Advisors, 2014, 2015). For

[2] Their result is consistent with Lakonishok, Shleifer and Vishny's (1994) extrapolation hypothesis which predicts a negative relation between pre- and post-formation profitability and returns of individual firms. The essence of the extrapolation theory is that investors naively extrapolate past growth rates of firms.

example, a NAV premium typically means a firm can generate a return on new investment that exceeds its cost of capital.

Finally, the existence of a parallel private market allows a listed REIT to readily arbitrage its observed cost of capital advantage or disadvantage. More specifically, a REIT can permanently increase its NAV and create shareholder value by funding asset growth when NAV premiums are positive and buying back stock or paying off debt with the proceeds from the sale of properties when its stock is selling at a discount to NAV. This arbitrage opportunity is not generally available to firms in other industries.

Our empirical investigation is guided by the following research question: Does REIT asset expansion tend to be followed by periods of abnormally low stock returns? In other words, can investors use the asset growth rates of REITs to improve their predictions of future returns? We also examine the extent to which the existence of NAV premiums and discounts interacts with the asset growth effect. More specifically, is the asset growth effect on returns over the next year more positive (less negative) for firms with a positive P/NAV? We also seek to isolate the channels through which asset growth affects subsequent returns. In particular, does growth in real estate assets produce different return results than growth in non-real estate assets? Also, are subsequent returns related to the amount and type of debt used to finance an expansion of the asset base?

The research strategy involves measuring the asset growth rates of a cross-section of 308 unique REITs from 1993 to 2013. The empirical tests are carried out in three stages. First, sorting REITs by their asset growth rate in the preceding year, we construct five-equally sized REIT portfolios and measure their subsequent returns over different investment holding periods (ranging from six months to 3-years). Raw and risk-adjusted returns of the different asset growth portfolios are then examined for evidence of an asset growth effect. Second, we estimate a series of Fama-MacBeth (1973) cross-sectional return regressions on asset growth and other firm attributes to control for the effects of "size" (Banz, 1981), "value" (Fama and French, 1992), "momentum" (Jegadeesh and Titman, 1993), as well as accounting performance measures, on stock performance. Finally, we decompose total asset growth into its major components from both the left-hand (investment) side and right-hand (financing) side of the balance sheet to isolate the channels driving the relationship between asset growth and stock performance.

We find the portfolio returns of REIT "hares" are significantly lower than the returns of REIT "tortoises" in the following year. The mean 1-year equally-weighted return for the slowest growing portfolios is 18.6%, as compared to 12.2% for the fastest growing portfolios. This return spread of -6.4% is statistically significant at the 5% level. The negative relationship between asset growth rates and future return remains after adjusting for firm size and risk. The inverse relationship between asset growth rates and return performance strengthens when the subsequent holding period is increased to two, three, four and five years. Nevertheless, the magnitude of the asset growth effect on one-year REIT returns (-6.4%) is smaller than the return spread of the fastest and slowest growing industrial firms (-22.8% in CGS, 2008).

In our Fama-MacBeth (1973) cross-sectional regressions that do not condition on NAV premiums and discounts, we find weak evidence of a negative asset growth effect. However, consistent with CGS (2008), we find that asset growth dominates the effects of conventional return determinants, including firm size, the B/M ratio, and return momentum. Measures of lagged accounting performance, such as the return on assets and changes in working capital, do not predict returns over the next 12 months. In our subsample of firms for which we have estimates of NAV premiums and discounts at the beginning of the year over which asset growth is measured, the negative asset growth effect is stronger. However, we find evidence that the growth effect is significantly less negative for firms selling at a premium to NAV. This is consistent with their cost of capital advantage. Over our full sample, we find weak evidence that apartment and retail REITs outperformed REITs with a focus on other property types and weak evidence that apartment and retail REITs were less susceptible to the negative effects of asset growth. Our regression results are robust to a series of checks, including the addition of accounting performance variables to the regressions, the use of 36-month return horizons, and alternative measures of asset growth.

Decomposing the source of year-on-year asset growth, it is not surprising to note that REIT growth is driven primarily by expansions in their real estate holdings (92.6%). Asset growth is funded primarily by additional debt (58.3%) and equity (39.8%) capital and, to a smaller extent, changes in minority interests (2.8%). On the asset investment side, the decomposition results show the negative asset growth effect is driven by the expansion of non-core assets; the rate of growth in real estate assets does not appear to significantly affect future return performance.

On the asset financing side, the negative asset growth effect is not driven by growth in equity capital. Moreover, the market does not appear to differentiate between the alternative channels of equity expansion, namely preferred equity issuance, secondary equity offerings (SEOs), or retained earnings. The evidence instead shows that REITs which expand their asset base by employing more debt in their capital structure are associated with negative return performance over the next 12 months. Further analysis suggests that the observed negative relationship between lagged one-year growth rates and REIT returns appears to be associated primarily with the issuance of unsecured debt, regardless of its loan maturity period. This is consistent with agency cost of debt explanations in which the provision of collateral associated with secured debt and the refinancing risk associated with debt restrict managers and shareholders from engaging in sub-optimal investment activities.

The rest of the paper is organized as follows. The next section provides additional background information on REITs and further develops our testable hypotheses. Section 3 describes the data used in this study. Section 4 discusses the empirical results of both the univariate sorts and the cross-sectional regressions on the impact of asset growth rates on the future return performance of REITs. Section 5 presents the research design and findings of the decomposition analysis used to isolate the effect of different asset growth channels. Section 6 concludes.

2.0 Additional Background on REITs and Hypothesis Development

REITs have expanded rapidly in size the last two decades. As shown in **Figure 1**, the asset size of the average REIT have risen from approximately $500 million in 1993 to over $4 billion in 2013. This rapid growth can be attributed to several industry innovations. The introduction of the UPREIT structure in 1992 facilitated the ability of property sellers to defer the recognition of accrued capital gain tax liabilities when transferring properties to the UPREIT. This led to an increase in the supply of properties available for acquisition by REITs. From the demand side, changes in the "five or fewer rule" in 1993 made it easier for pension funds to invest in REITs.[3] The REIT Modernization Act of 1999 also transformed REITs from a passive investment vehicle to an actively-managed investment vehicle. The inclusion of Equity Office Properties Trust and Equity Residential Properties in the S&P 500 Index in late 2001 further attracted the attention of large institutional investors to REITs as an alternative investment.

At the firm level, individual REITs do not grow at the same rate. Moreover, some REITs grew aggressively through mergers and portfolio acquisitions while others focused on development. Although the year-on-year growth rate of REIT assets in our sample averaged 10.8% from 1992 to 2013, the standard deviation was 21.0%. Given the heterogeneity, an interesting question is whether the variation in asset growth can be used as a predictor of the return performance of listed REITs. In other words, do fast growing REITs (the hares) outperform slower growing REITs (the tortoises) over different investment holding periods?

It is not certain the extent to which the asset growth anomaly should apply to REITs due to their unique regulatory environment. REITs are required to disburse to shareholders 90% of net taxable income, excluding net capital gains, to maintain their tax exempt status. These high dividend payout ratios mitigate the potential adverse effect of "reinvestment of earnings."[4] Moreover, the high payout ratios subject REITs to frequent monitoring from the capital markets because of their heavy reliance on external financing. This counteracts the potential adverse effects of "weak governance" (Titman, Wei and Xie, 2004). REIT stocks are also relatively easy to value because they primarily buy and hold tangible real estate assets acquired and disposed in a well-functioning parallel private. This reduces the potential for mispricing caused by an "overreaction" to the release of accounting information or other news (CGS, 2008; LMS, 2011).

---

[3] Beginning with its second taxable year, a REIT must meet two ownership tests: it must have at least 100 shareholders and five or fewer individuals cannot own more than 50 percent of the value of the REIT's stock during the last half of its taxable year (the "5/50 Test"). A pension trust is not treated as a single shareholder. Rather, the beneficiaries of the pension trust are counted in determining the number of REIT shareholders (Section 856(h)(3) of the Internal Revenue Code).

[4] REITs are potentially subject to tax on undistributed REIT taxable income, undistributed net capital gain, the income "shortfall" in failing to meet certain income requirements, and income from prohibited transactions.

Finally, the empirical evidence suggests that the negative asset growth effect is driven primarily by small cap stocks (Fama and French, 2008; Gray and Johnson, 2011). In contrast to the asset holdings of the slowest growing ($20.86 million) and fastest growing ($66.69 million) industrial firms in CGS (2008), the asset holdings of REIT tortoises and hares are $1.97 billion and $2.15 billion, respectively. Thus, the typical REIT is closer to a medium cap stock that may be less prone to "growing pains" than the typical industrial firms.

On the other hand, REITs purchase (or develop) and sell assets in illiquid private markets. The required payments to brokers, lawyers, accountants, and other third-party service providers significantly increase transaction costs. This could help explain why two companies of similar size with similar capital structures and property sector/geographic footprints can perform differently if one company is rapidly growing externally and the other is not.[5] In short, the benefits to asset growth (e.g., lower G&A loads and better access to unsecured debt) may not offset the transaction costs associated with rapid external growth.

3.0 Data

Our study begins with the universe of publicly-listed U.S. equity REITs compiled by National Association of Real Estate Investment Trusts (NAREIT) from 1993 to 2013. We also compared our list to Feng, Price and Sirmans' (2011) list of equity REITs from year 1993 to 2009, supplemented with records of REIT IPOs after 2009, which is available on NAREIT website. For completeness, we also follow Ling and Naranjo (2015) and use the CRSP-ZIMAN REIT dataset to identify firms that may have been omitted from the NAREIT sample. The sample also includes delisted REITs to reduce survivorship bias.

Annual returns for the i^{th} REIT in year t are measured from July of year t to June of year t+1. Following the standard practice in the literature, the asset growth rate used to predict returns in year t ($ASSETG_{it}$) is the percentage change in the book value of total assets plus depreciation from the fiscal year ending in calendar year t-2 to the fiscal year

[5] We thank Andrew McCulloch for making this observation.

ending in year *t-1*. That is,

$$ASSETG_{i,t} = \frac{[Total\ Assets+Depreciation]_{i,t-1} - [Total\ Assets+Depreciation]_{i,t-2}}{[Total\ Assets+Depreciation]_{i,t-2}} \quad (1)$$

A REIT must therefore have two consecutive years of data for total assets to be included in our sample.[6] This mitigates potential backfilling biases (Fama and French, 1993).[7] Observations with negative total assets or book equity value in a given year are dropped from our sample. To mitigate the impact of extreme values, growth rates are winsorized at the 1% and 99% level.[8] Remaining observations with *ASSETG* > 100% are deleted. After the filtering process, the final sample consists of 2,694 firm-year observations. The unbalanced panel contains 308 unique REITs with the average REIT remaining in the sample for approximately 10 years.

Accounting data and stock returns were obtained from the COMPUSTAT annual industrial files and the CRSP monthly stock return files. Financial variables used to predict returns in year *t* (July of year *t* to June of year *t*+1) are obtained from accounting information from fiscal year-end *t-1*. Financial and accounting variables are also winsorized at the 1% and 99% level.

Descriptive statistics of the sampled REITs are presented in **Table 1**. Total depreciation adjusted asset holdings (*ASSETS*) and the equity market capitalization (*MV*) of the average REIT are $2.2 billion and $1.5 billion, respectively. The average book-to-market ratio (*B/M*) and total debt ratio (*DEBT*) are 0.83 and 0.47, respectively. The average return on total assets (*ROA*) is 5.5%.

The mean asset growth rate of the sampled REITs is 10.8%. The median asset growth rate of 5.4% indicates that the distribution of growth rates is skewed to the right. The 21.0%

---

[6] The majority of firms in our sample have fiscal years that end in December. For these firms, growth ending in fiscal year 1992 would be measured from December 1991 to December 1992. This growth would then be used to predict returns in July of 1993 to June of 1994. Note that for firms with December fiscal year ends, there will be a six month lag between the end of the fiscal year over which growth is measured and the start of the 12 months over which returns are measured. However, this six month lag is necessary because some firms end their fiscal year sometime in the first six months of the next calendar. To ensure the 12 months over which asset growth is measured does not overlap with the 12 months over which returns are measured for firms with fiscal years that end in the next calendar year, returns for all firms in the sample are measured beginning in July of the calendar year following the end of the previous fiscal year.

[7] Backfilling refers to the practice of back-dating the coverage of a company during their initial years. As a result, the current dataset may contain more information than what could be actually observed back in time. Backfilling poses an issue for the sorting analysis because the firms selected may not have been covered by the dataset at time of portfolio construction.

[8] This means that extreme values below the 1th percentile are set to the 1th percentile level, and those above the 99th percentile are set at the 99th percentile.

standard deviation signifies substantial variability in annual growth rates across REITs and over time. **Figure 2** shows that average asset growth varies substantially over time. During the mid-to-late 1990s, average asset growth increased considerably, from less than 5% per year in 1992 to more than 30% in 1998. This expansion in assets was eventually halted by the bursting of the dot-com bubble during 1999-2001. In the following decade, the expansion of asset holdings resumed, peaking at 14% per year during 2006-2007. The average asset growth rate of REITs was slightly negative (-0.2%) in 2009-2010 in the wake of the recent credit crisis. The average rate of asset growth has since increased annually, reaching almost 12% in 2012-2013.

At the end of June each year, REIT stocks in the top 20% by asset growth rate are placed in Quintile 5, while those in the bottom 20% are placed in Quintile 1. The remaining REIT stocks are placed in the intermediate portfolios (Quintiles 2, 3 and 4). The number of REIT stocks in the quintile portfolios ranges from a minimum of 20 (in 1993) to a maximum of 33 (in 1997). The portfolios are reconstructed at the end of June each year based on asset growth over the preceding fiscal year.[9]

Table 2 reports summary statistics for key REIT attributes by asset-growth rates. The spreads between Quintile 5 and Quintile 1 and associated t-statistics are also reported. By construction, *ASSETG* increases monotonically across the portfolios. The average asset growth rate is 40.1% for REITs in quantile 5 and -9.9% for REITs in quantile 1. The average annual spread between the fastest and slowest growing REITs is 50.0%.

A strong persistence in asset growth rates is observed prior to the annual sorting. In other words, REIT hares consistently record higher asset growth rates, relative to REIT tortoises, over the preceding 3 years. In years -1, -2, and -3, the spread in annual growth rates between the fastest and the slowest growing firms is 19.4%, 11.6%, and 8.7%, respectively. A similar trend is observed over the 3 years following the portfolio formation. In years +1, +2, and +3, the spread in annual growth rates between the REIT hares and tortoises is 19.9%, 14.1%, and 8.6%, respectively. Further untabulated results reveal that, on average, 33.1% of REITs remained in the same quintile portfolio the subsequent year.[10]

Panel B in Table 2 reports attribute means for REITs in the different growth portfolios.

[9] For example, based on asset growth from fiscal year end 1991 to fiscal year end 1992, the first batch of portfolios are constructed in July of 1993 and held through June of 1994. The last batch of portfolios is constructed based on asset growth from fiscal year 2011 to fiscal year end 2012, and held from July 2013 through June 2014.

[10] Of the remaining REITs that switched quintiles in the following year, 35% involved shifts to the adjacent quantile with less than 13% actually switching by more than two quintiles within a year.

Two proxies are used to represent firm size, the book value of total assets (*ASSETS*) and the market capitalization of stocks (*MV*). The latter is computed as the price per share of common equity multiplied by the number of outstanding shares of the constituent REITs at the end of June of year *t*. The positive asset size spread (Q5-Q1) is statistically significant for *MV*, which suggests the necessity to control for firm size in our subsequent examination on portfolio returns.

The average *B/M* ratio is negatively related to asset growth. Consistent with Gray and Johnson (2011), this indicates that REIT hares tend be "growth" stocks in the Fama-French sense. The accounting performance (*ROA*) of hares in the prior fiscal year is significantly higher than tortoises, but the relationship across quintiles is not monotonic. There is, however, no discernible difference in the debt ratios of hares and tortoises. Thus, on average, REITs that grew faster over the prior fiscal year prior did so in a balance sheet neutral fashion. REIT hares registered higher buy-and-hold returns than tortoises over the 11 months preceding portfolio construction (BHR_{11}), which is consistent with the extrapolation hypothesis that fast growing firms over-performed prior to portfolio formation (see Lakonishok, Shleifer and Vishny, 1994). However, the relationship is not statistically significant and not monotonic across the quintiles. The decrease in accruals among hares is significantly less than slower growing firms. Not surprisingly, hares issue significantly more stocks than tortoises in the year preceding portfolio formation. This is consistent with Ong, Ooi and Kawaguchi (2011) who observed that REITs are more aggressive in their acquisitions leading up to the equity offerings. Overall, Table 2 shows that large REITs with growth opportunities and a strong track record (in terms of either accounting or stock returns) are more likely to rapidly expand their asset base.

4. Results

4.1 Univariate Return Sorts

To determine whether REIT hares produce inferior returns to tortoises, the total returns for each portfolio are first calculated over next 12 months (from July of year *t* to June of year *t*+1) following their formation. We also track the portfolio returns over two-to-five year horizons to examine the long-run return effects of portfolio sorting based on asset growth rates. We also report the value-weighted (VW) returns of the respective portfolios to ensure our results are not driven by small firms. The market value of equity at the end of

June in calendar year t is used as weight to construct the time series returns of the VW portfolios. The results are reported in **Table 3.** The return spread of the extreme portfolios (Q5-Q1) is also reported. This spread corresponds to an investment strategy of buying REIT hares and shorting an equal amount of REIT tortoises. The figures presented are the average across all the portfolio formation periods in the sample. Time-series variation over the sample period is used to compute the significance level for the reported spreads. The Newey and West (1987) procedure was applied to correct for serial correlation in returns induced by overlapping holding periods for return horizons greater than one year.

Panel A of Table 3 shows that the mean 1-year equally-weighted (EW) return for the tortoises portfolios is 18.6% compared to 12.2% for the hares portfolios. This return spread of -6.4% is statistically significant at the 5% level. The negative relation between asset growth and subsequent returns is also persistent. The cumulative 5-year average holding period return for slow growing REITs is 112% compared to 67.8% for the portfolios of REIT hares. The spread between the two portfolios is -44.0% (t-statistic = - 5.23), which suggests that asset growth is a useful predictor of future REIT returns, particularly over longer investment horizons. Panel B reports the returns on a VW basis. As expected, the VW portfolio returns are uniformly lower than EW portfolio returns. In addition, the negative asset growth effect is marginally weaker for the VW portfolios. In particular, the mean return spread over holding periods of less than five years is statistically insignificant. The spread in 5-year holding period returns between the two extreme portfolios is -19.6% and statistically significant (t-statistic = - 1.96).

Table 3 shows that asset growth rates are generally good predictors of future REIT returns; however, the magnitude of the negative growth effect is less pronounced than what is typically found for common stocks. As an additional robustness check, we compute the market-adjusted returns of each portfolio. Specifically, five portfolios of REIT stocks are constructed in July of each year based on their equity market capitalization at the end of June. The EW returns for each portfolio sorted by size are then computed over various investment horizons. The market-adjusted returns of our asset growth portfolios are measured as their raw EW returns minus the corresponding size-quintile returns. These results, which are reported in Panel C, show that the return spread of the EW high growth investment strategy is still significant after adjusting for market returns. Over a 12-month holding period, the buy hares and short tortoises investment strategy yields a -3.99% return, which is significant at the 5% level. As observed previously, the return spread increases with the investment horizon.

A closer examination of the market-adjusted returns for the Q1 portfolios reveals that the cumulative returns of low growth REITS increases from 1.98% to 9.77% over the five-year horizon. Interestingly, the cumulative returns of REIT tortoises are fairly stable at around 4.8% to 5.0% in years 2, 3 and 4. On closer examination, the divergent performance is due primarily to the returns of hares declining over time. In particular, the cumulative returns of Q5 portfolios falls steadily from -2.01% in year 1 to -7.9% in year 5. The long-run underperformance of fast growing firms is consistent with the market correcting investors' over-reaction to past performance of high growth firms as new information is released gradually.

A potential explanation of the outperformance of the tortoises is the high transaction costs associated with acquiring properties in illiquid private markets. Another possible explanation for the observed negative growth effect is the hypothesis that expected returns should decline systematically in response to increasing investment (CGS, 2008). A number of theoretical papers have argued that the value of growth options relative to existing assets declines as firm investment grows. These models point to a reduction in overall firm risk as investment increases, thereby inducing a negative relation between investment and expected return (Berk, Green and Naik, 1999).

4.2 Risk Adjusted Return Sorts

To examine whether our results can be explained by a reduction in firm risk, **Table 4** compares the risks of the different asset growth portfolios. Two conventional risk measures, standard deviation and the beta derived from a 3-factor model, are employed. If the risk-based explanation of inferior performance of fast growing firms is correct, we would expect portfolios of hares to exhibit lower risk than tortoise portfolios. However, inspection of Table 4 reveals the differences in return volatilities and systematic risk are small in magnitude and not statistically significant. For example, the average 3-factor beta for the fastest growing REITs is 0.705, compared to 0.820 for the slowest growing REITs. The difference is not statistically significant (t-statistic = -1.52). Although not separately tabulated, the same conclusion is reached when we value weight, instead of equally weight, standard deviations and betas.

We next compare the risk-adjusted performance of the different growth portfolios over subsequent 1-year and 3-year holding periods. Two risk-adjusted measures of portfolio performance are employed: the Sharpe ratio and the Fama-French 3-factor alpha. The Sharpe ratio is the average portfolio return in excess of risk-free rate, per unit of total return volatility. The 3-factor alpha captures the portion of excess returns not explained by the market risk premium (*MRP*), *SMB*, and *HML*.[11] As shown in Panel B of Table 4, the average risk-adjusted return performance of hares continues to lag behind tortoises. The portfolio of REIT tortoises produced a 1-year Sharpe ratio of 0.221 compared to 0.142 for the hare portfolio. The difference of -0.080 is statistically significant at the 10% level. The analysis using the 3-factor model yields similar results. Furthermore, the significance of the return spread increases with an investment horizon of three years. In summary, the unconditional risk-adjusted results are consistent with our earlier results using raw returns; that is, asset growth is a reliable predictor of future REIT returns. The results are robust to the exclusion of REITs with negative growth rates from the sample.

To examine how the asset growth effect varies over the study period, **Figure 3** plots the one-year return spread from buying REIT tortoises and simultaneously selling hares over a one-year investment horizon. Over the 21 year study period, this long-short trading strategy would have generated positive annual returns 14 times for the EW portfolios, and 13 times for the VW portfolios. The largest payoff, in terms of EW returns, would have been 30.1% in 2012. The same long-short investment strategy would have produced a loss of -13.7% in 2000.

---

[11] Time series data on the Fama-French factors and risk-free rates of return were obtained from the webpage of French. SMB, which stands for Small Minus Big, measures the historic performance of small cap stocks over big cap stocks. HML, on the other hand, stands for High Minus Low. It measures the historic excess returns of value stocks over growth stocks.

4.3 The Effects of NAV Premiums and Discounts

Green Street (2014, 2015) advocates a simple capital allocation strategy for REIT managers: fund asset growth when NAV premiums are positive and buy back stock or pay off debt with the proceeds from asset sales when the firm is selling at a discount to its NAV. Although theory suggests overvalued firms can create value for shareholders if they exploit their overvaluation by using their stock as currency to purchase less overvalued firms, Fu, Lin and Officer (2013) find that overvalued acquirers significantly overpay for their targets. These acquisitions do not, in turn, lead to synergy gains.[12] Although the existence of a NAV premium may signal the firm has a cost-of-capital advantage and should grow the firm's assets, several studies have concluded that NAV premiums reflect, at least in part, both firm-specific and market-wide investor sentiment (Barkham and Ward, 1999, Clayton and MacKinnon, 2001). Moreover, an extensive literature documents a negative relation between high levels of investor sentiment and subsequent stock returns (Baker and Wurgler, 2006, 2007; Brown and Cliff, 2005).

Gentry, Jones, and Mayer (2004) argue that some cross-sectional variation in price-to-NAV ratios reflects variation across firms in recent and expected NAV growth. However, the authors conclude there is too much volatility in REIT price-to-NAV ratios, generated by swings in market-wide sentiment, which gives rise to potential excess returns from short-term mean reversion. Empirically, Gentry et al. (2004) find large positive excess returns from a strategy of shorting stocks trading at a premium to NAV and buying stocks trading at a discount. We therefore examine the predictive power of NAV premiums and discounts, as well as the extent to which premiums and discounts interact with the asset growth effect.

Our firm-level NAV premium and discount data were obtained from Green Street Advisors, a prominent buy-side analyst and provider of commercial real estate and REIT research (www.greenstreetadvisors.com). Green Street restricts it analyst coverage to the most actively traded REITs. We were able to match 865 of our 2,964 firm year observations

[12] Moreover, since these acquisitions seem to be concentrated among acquirers with the largest governance problems, Fu, Lin and Officer (2013) conclude that CEO compensation, not shareholders value creation, appears to be the main motive behind acquisitions by overvalued acquirers.

(32%) with Green Street's P/NAV data. Panel A of **Table 5** presents summary statistics for key firm characteristics for the 865 observations in this subsample. Panel B contains the corresponding summary statistics for the 1,829 firm year observations for which P/NAV estimates are not available from Green Street. The final two columns contain differences in the two subsamples means and associated t-tests.

REITs with Green Street P/NAV data are significantly larger (*ASSETS* and *MV*), have lower *B/M* ratios (indicating more growth options), higher leverage ratios (*DEBT*), and better accounting performance (*ROA*). Their average asset growth rates (*ASSETG*) are also significantly higher than REITs without Green Street P/NAV data. However, there is no significant difference in average buy-and-hold returns in the subsequent year. **Figure 4** charts the average distribution of premiums to NAV of the sampled REITs from 1993 to 2013. The vertical lines show the range of P/NAVs. The chart shows substantial variation over time, with the average P/NAV falling below 1.0 in 1993, 1999-2001 and 2007-2009. These discount periods coincide with general weakness in the stock market. For example, Clayton and MacKinnon (2001) noted that REIT values plummeted in 1998, causing REITs to sell at discounts to NAV in 1999. REIT prices also plunged in 2007 and 2008, despite generally strong real estate fundamentals, as the recent financial crisis unfolded. REIT prices began to recover in the second quarter of 2009. REIT share prices also fell in mid-2013 amid fear of rising interest rates sparked by the comments of the Federal Reserve Board. After recovering strongly in 2014, REIT share prices were again buffeted by concerns about rising interest rates.

Year-over-year asset growth rates are measured from the end of fiscal year t-2 to t-1. We therefore condition each annual growth rate on Green Street's P/NAV estimate at time t-2. After examination of the P/NAV frequency distribution, REITs were sorted into three P/NAV buckets in each period: (1) P/NAV > 1.03; (2) 0.97 ≤ P/NAV ≤ 1.03; and (3) P/NAV < 0.97. Our 865 firm year observations with available P/NAV data include 431 REITs selling at a premium, 307 REITs selling at a discount, and 127 selling within three percent of its NAV.

Key summary statistics for these three subsamples are provided in **Table 6**. The final two columns contain differences in the means of premium and discount REITs and associated t-tests. Firms selling at a premium are on average significantly larger (*ASSETS* and *MV*), have lower *B/M* ratios, and display better accounting performance (*ROA)*. However premiums firms use significantly less leverage, on average. More importantly, premium firms are associated with significantly more asset growth, which is consistent with a growth strategy focused on cost of capital. However, premium firms produce average returns over the next 12 months that are 8.3% lower than returns produced by firms selling at a discount. This is consistent with market-wide sentiment pushing stock prices away from fundamental values in the short run, which gives rise to potential profits when stock prices mean revert.

5.0 Cross-Sectional Regressions

The results of the raw and risk-adjusted univariate sorts indicate the return performance of fast growing REIT has lagged the performance of slower growing REITs; moreover, the conventional "risk-return trade-off" explanation does not adequately explain these results. In this section, we estimate annual Fama-MacBeth (1973) cross-sectional return regressions to control for the potential effects of additional firm characteristics and to examine the marginal effect of asset growth on REIT stock returns.

The estimation process is implemented in two steps. First, a cross-sectional return regression is estimated each year from July of time t to June of time t+1 for a total of 21 annual regressions. The form of the regression is

$$RET_{in} = C_n + \beta_{1_n} ASSETG_{in} + \boldsymbol{B_{2_n} Control_{in}}\,, \qquad n = 1, 2, 3 \ldots 21 \tag{2}$$

RET_{in}, is the total return of REIT *i* in year *n* and $\boldsymbol{Control_{i,n}}$ is a vector of control variables applicable to returns in year *i*. $ASSETG_{i,n}$ and $\boldsymbol{Control_{i,n}}$ are updated annually at end of June using accounting information from year t–1. The reported coefficient estimates are the time-series averages of the first-step coefficient estimations. The corresponding t-statistics are the time-series averages of the first-step t-statistics divided by the standard error.[13] That is,

[13] The standard errors of time-series averages have been adjusted for first-order autocorrelations by

$$C = \sum_{n=1}^{21} \frac{C_n}{21}; \quad \beta_1 = \sum_{n=1}^{21} \frac{\beta_{1n}}{21}; \quad \boldsymbol{B_2} = \sum_{n=1}^{21} \frac{\boldsymbol{B_{2n}}}{21} \tag{3}$$

To identify the marginal predictive power of lagged annual asset growth on future stock returns, we first include as annual control variables the market capitalization of equity (*MV*), the *B/M* ratio, and stock returns over the past 11 months (BHR_{11}).[14] According to Banz (1981) and Keim (1983), small-sized firms produce higher risk-adjusted returns than larger firms. Stocks with higher *B/M* ratios (value stocks) also tend to produce higher average returns (Fama and French, 1992; Rosenberg, Reid and Lanstein, 1985). The inclusion of firm-level *MV* and *B/M* is similar in spirit to the standard three-factor asset pricing model. Finally, momentum theory suggests past returns can be used to predict future returns (Chui, Titman and Wei, 2003; Jegadeesh and Titman, 1993).

We then extend the base cross-sectional regression model to incorporate three additional explanatory variables: *ROA* (firm profitability), *ACCRUALS* (accruals), and *ISSUANCE* (stock issuance). Haugen and Baker (1996), Cohen, Gompers and Vuolteenaho (2002) and Fama and French (2006) show that average returns are positively related to recent profitability. Sloan (1996) further shows that accruals are negatively related to future profitability and stock returns. Finally, the net issuance of equity is shown to have a negative impact on subsequent stock returns (Loughran and Ritter, 1995; Pontiff and Woodgate, 2008).

The regression results for the base and extended models using the full sample are reported in Table 7. Both are based on a 12-month return horizon. The average estimated coefficient on *ASSETG* is negative and significant at the 10% level in both the base model (1) and extended model (2). None of the control variables are significant in the base model or extended model, although the three accounting variables are jointly significant and improve the explanatory power of the model.

---

multiplying the standard errors of the average parameters by $\sqrt{(1+\rho)/(1-\rho)}$, where ρ is the first-order autocorrelation in yearly parameter estimates (CGS, 2008). For return horizons of three years, ρ is the third-order autocorrelation in yearly parameter estimates.

[14] In Fama and French (2008), the momentum anomaly is tested with past 11 months returns from month j-12 to month j-2. CGS (2008), on the other hand, used returns over the past 6 months and 36 months returns for a broader coverage of past returns. Our results are not sensitive to the alternative proxies for momentum.

We next re-estimate the base and extended model using the subsample of REITs for which we have Green Street NAV premiums and discounts. These results are reported in Table 7 as models (3) and (4). Note the decline in firm-year observations from 2,694 to 865. The average estimated coefficient on *ASSETG* is no longer significant in either the base or extended model. However, the average coefficient on BHR_{11} is positive and significant at the 5% level. None of the other control variables are significant in either model. In these specifications, it appears returns over the subsequent 12 months are driven by momentum, not asset growth.

To analyze the impact of conditioning on NAV premiums and discounts, we create several additional variables. First, *NAVPREM* is set equal to one if P/NAV > 1.03. Second, *NAVDIS* is set equal to one if P/NAV < 0.97. These dichotomous variables are created for each REIT at the beginning of each year over which asset growth is measured. The inclusion of these shift variables in the cross-sectional return regressions will allow us to determine whether returns in year t to $t+1$ are associated with NAV premiums and discounts at time $t-2$.

Our primary concern, however, is whether the effects of asset growth on returns are related to NAV premiums and discounts at the beginning of the year over which asset growth is measured. We therefore create two interaction variables to address this question. First, *ASSETGxNAVPREM* is set equal to the product of *ASSETG* and *NAVPREM*. A positive coefficient on this interaction variable would indicate the effect of asset growth on returns is greater (less negative) when P/NAV is greater than 1.03. This would be consistent with the cost of capital advantage growing REITs have when P/NAV is greater than one. Second, *ASSETGxNAVDIS* is set equal to the product of *ASSETG* and *NAVDIS*. A negative coefficient on this variable would indicate that the effect of asset growth on returns is more negative (less positive) when P/NAV is less than 0.97. This would be consistent with a cost of capital disadvantage for growing REITs when P/NAV is positive.

The results that include these four NAV premium and discount variables are reported as models (5) and (6) in Table 7. Several findings are especially noteworthy. First, the average estimated coefficient on *ASSETG* in our cross-section regressions is again negative and significant at the 5% level with and without accounting control variables. The average coefficient on *BHR_{11}* remains positive and significant at the 5% level, suggesting the continued influence of return momentum. The remaining control variables, including the accounting variables, are not, on average, significant in either model (5) or (6).

The average estimated coefficient on *NAVDIS* and *NAVPREM* is not significant in models (5) and (6). This implies that conditioning on P/NAVs does not enhance our ability to predict subsequent one-year returns. However, on average the estimated coefficient on *ASSETGxNAVPREM* is positive and significant at the 5% level in both model (5) and (6). That is, the effect of asset growth on returns is significantly less negative for REITs with P/NAV > 1.03 at the beginning of the year over which growth is measured. However, the average magnitude of the positive coefficient on *ASSETGxNAVPREM* is less than the average magnitude of the negative coefficient on *ASSETG* in both model (5) and (6). Thus, the negative asset growth effect on future returns is not significant for firms with P/NAV > 1.03. This is consistent with the simple capital allocation strategy of funding asset growth when NAV premiums are positive. The average coefficient on *ASSETGxNAVDIS* in both model (5) and (6) cannot be distinguished from zero. This is not consistent with asset growth creating more value destruction for REITs selling at a discount to NAV, as may be expected given that such REITs should be selling assets and buying back stock given their cost of capital disadvantage.

We repeated the analysis after splitting the sample into two equal halves: July 1993-June 2003 and July 2003-June 2014. The cross-sectional regression results for the July 1993-June 2003 subsample are reported in **Table 8**. Once again, the dependent variable is the 12-month stock returns from year *t* to *t*+1. The average coefficient on *ASSETG* is insignificant in all six model specifications. In fact, the only standard asset pricing variable that is significant is *BHR_{11}*, although the average coefficients on *B/M*, *ROA* and *ISSUANCE* are negative and significant at the 10% level in model (4). Moreover, none of the NAV premium and discount variables included in models (5) and (6) are significant.

The cross-sectional regression results for the July 2003-June 2014 subsample are reported in **Table 9**. The average coefficient on *ASSETG* is marginally significant in models

(1) and (2), as well as model (5). Similar to the full sample, the estimated coefficient on *ASSETGxNAVPREM* is positive and significant at the 5% level in model (5) and the 10% level in model (6). That is, the asset growth effect for premium REITs is significantly less negative, although the average magnitude of the positive coefficient on *ASSETGxNAVPREM* is less than the average magnitude of the negative coefficient on *ASSETG* in both models. Similar to the full sample, the average coefficient on *NAVDIS* and *ASSETGxNAVDIS* in both model (5) and (6) cannot be distinguished from zero. This suggests the return performance of discount REITs and the effect of asset growth on returns for these RETTs can't be distinguished from the control group of REITs selling within 3% of the NAVs. However, the estimated coefficient on *NAVPREM* in both model (5) and (6) is negative and significant at the 10% level. Consistent with Gentry et al. (2004), this finding is consistent with NAV premiums being driven, at least in part, by elevated investor sentiment, which gives rise to reduced returns as sentiment, and prices, mean revert.

Asset price movements across different property sectors are correlated, but the magnitude of prices movements can vary because different property sectors/types have different rental market demand and supply drivers. Moreover, changes in investor perceptions/sentiment can cause investment capital to flow quickly from one property sector to another. Although not reported in Tables 7-9, these regression include property type fixed effects. The estimated coefficients on these dummy variables indicate that apartment and retail REITs marginally outperformed REITs with a focus on other property types over the full sample. Additionally, we find weak evidence that apartment and retail REITs were less susceptible to the negative effects of asset growth.

5.1 Robustness Checks

Our univariate return sorts revealed that asset growth is a useful predictor of future REIT returns, particularly over longer investment horizons. To examine this finding in a multivariate regression framework, we replicate our analysis using a 36-month return horizon. Although not separately tabulated, the negative effect of asset growth on returns is stronger over the longer return horizon. This result is consistent with CGS (2008) who interpret the negative asset growth effect as a process of correcting investors' overreaction to the past performance of high growth firms as new information is released gradually. However, NAV premiums and discounts, as well as the interaction of P/NAVs with asset growth, are not predictive of returns over the subsequent 36 months.

We also replicated our analysis using returns over the next six months. Over this shorter horizon, the average coefficient on *ASSETG* is negative and significant only in model (5). However, the estimated coefficient on *ASSETGxNAVPREM* is positive and highly significant in both model (5) and (6). Taken together these return horizon robustness checks suggest that the negative effect of asset growth is stronger over longer horizons; in contrast, the positive coefficient on *ASSETGxNAVPREM* is more significant over shorter horizons. This could be because P/NAVs are measured at the end of year *t*-2 and may exhibit significant variation from year to year.

We measure $ASSETG_{it}$ as the percentage change in the book value of total assets plus depreciation from the fiscal year ending in calendar year *t-2* to the fiscal year ending in year *t-1*. As a robustness check, we replicate our analysis using the percentage change in the book value of assets from year *t*-2 to year *t*-1 without adjusting for depreciation. Although not separately tabulated, these results are very similar to our base-case results. We also tried interacting *ISSUANCE* with *NAVPREM* and with *NAVDIS* to differentiate the effect of *ISSUANCE* conditional on whether the firm is selling at a premium or discount to its NAV. Although not separately tabulated, the interaction variables are not statistically significant. This result is nevertheless consistent with Fu, Lin and Officer (2013) who find that overvalued acquirers tend to overpay for their targets and that these acquisitions do not lead to synergy gains. We will explore this further in the next section.

6.0 Decomposition Analysis of Asset Growth

In this section, we seek to better understand the channels influencing the negative relationship between asset growth rate and future stock performance. For example, the effects of growing via acquisition of assets in a firm's core business (asset concentration) may differ from growing via acquisition of assets in non-core areas (asset diversification). Similarly, funding asset growth via debt issues may have a different impact on future stock performance than funding growth through equity offerings. We thus decompose the growth rate of total assets; firstly, by the different components of assets held by the individual REITs (the left-hand side of the balance sheet) and secondly, by how the asset growth was financed (the right-hand side of the balance sheet).

On the asset investment side, the year-on-year growth rate in total assets (*ASSETG*) can be decomposed into growth in real estate assets (*REG*) and growth in non-real estate assets (*NONREG*):

$$ASSETG = REG + NONREG \tag{4}$$

Non-real estate assets consist of intangibles and current assets, such as cash and receivables. With respect to funding, REITs can finance asset growth by taking on more debt (*DEBTG*), by expanding their equity base through retained earnings or secondary equity offerings (*EQUITYG*), by increasing minority interests (*MINORITYG*), or by a combination of the above.[15] Accordingly, asset growth can also be decomposed as follows:

$$ASSETG = DEBTG + EQUITYG + MINORITYG \tag{5}$$

The year-on-year growth in the individual components on both the right- and left-hand side of the balance sheet is defined as the change in their reported value from end of fiscal year *t*-2 to end of year *t*-1, scaled by the total book value of assets of the REIT at end of year *t*-2. This allows *ASSETG* to be specified as a linear combination of the year-on-year change in *REG* and *NONREG* on the investment side, and as a linear combination of year-on-year change in *DEBTG*, *EQUITYG* and *MINORITYG* on the financing side.

Table 10 presents the descriptive statistics of the year-on-year growth of the various components of asset growth. Recall from Table 1 that the average year-on-year growth in total assets (*ASSETG*) of the REITs is 10.8%. On the asset investment side, REIT growth is

[15] Minority interests represent non-controlling interests in consolidated subsidiaries and in consolidated operating partnerships in which the units can be converted into equity, which is applicable for UPREITs or DOWNREITs acquiring/deposing assets. In an UPREIT structure, property owners contribute their properties to an "umbrella partnership" in exchange for operating-partnership units. The operating-partnership units are the economic equivalent of the shares in a REIT itself. A DOWNREIT structure, on the other hand, is an expansion of an existing REIT or operating partnership by forming a new partnership. A REIT can have several DOWNREITs partners. See Singer (1996) for a detailed discussion on the UPREIT and DOWNREIT structures. REITs also use joint ventures. From our informal check with an industry source, only about 10-15% of REIT assets are owned in a joint-venture structure, which means that the equity component from their joint venture partners is lower.

driven primarily by expansions in their real estate holdings. Panel A shows that the growth in total assets can be attributed to 10% growth in real estate assets (*REG*) and 0.8% growth in non-real estate assets (*NONREG*). The change in non-real estate assets (*NONREG*) can be further broken down into growth in cash (*CASHG*), growth in current assets (*CASSETG*) and growth in other assets (*OASSETG*).

On the asset financing side, Panel B of Table 10 show that changes in outstanding debt constitute 6.3 percentage points of the 10.8% growth in assets. Growth in equity capital (*EQUITYG*) and minority interests (*MINORITYG*) constitute 4.3% and 0.3%, respectively, of the 10.8% total growth in assets. This finding is consistent with previous studies which conclude that despite the lack of tax incentives to employ debt, REITs prefer debt offerings to equity offerings because of the relatively low interest rates that characterized our sample period (Feng, Ghosh and Sirmans, 2007; Ooi, Ong and Li, 2010).[16]

To probe deeper, we decompose growth in equity capital into growth in common equity (*CEQUITYG*) and growth in preferred equity (*PEQUITYG*). Growth in common equity can be further decomposed into growth in common stock (*CSTOCKG*) and growth in retained earnings (*RETAING*). On the debt side, growth in total debt (*DEBTG*) is partitioned into their debt maturity and seniority structure. Debt can be decomposed into change in short-term debt (*SDEBTG*) and change in long-term debt (*LDEBTG*). Likewise, *DEBTG* can be replaced by the year-on-year changes in secured (*SCDEBTG*) and year-on-year change in unsecured debt (*USDEBTG*).

To examine how each of the growth constituents impact return performance, we estimate Fama-MacBeth regressions of REIT stock returns using each of the lagged components of asset growth. The dependent variable for the regression models is 12-month stock returns. Property type fixed effects, *MV*, *B/M*, BHR_{11}, *ROA*, *ACCRUALS*, and *ISSUANCE* are included as controls. The results of the decomposition analysis for *ASSETG*

[16] Ooi *et al.* (2010) noted that REITs relied more on equity capital from 1993 to 1997, but since 1998 have increasingly turned to the debt capital market for their funding requirements. Since 1999, debt financing has outpaced SEOs as the major source of capital for REITs. They posited that the change in preference is consistent with a market timing behavior. In particular, the historically low interest rates, following rapid development and innovations in the commercial mortgage-backed securities market and corporate bond markets, provided ample liquidity in the debt markets.

on the investment side are reported in **Table 11**.

Model (1) shows that stock market's reaction is indifferent to year-on-year changes in real estate assets (*REG*) and changes in non-real estate assets (*NONREG*). Growth in both categories of assets are not predictive of returns over the next twelve months. However, when the change in non-real estate assets (*NONREG*) is further broken down into growth in cash (*CASHG*), growth in current assets (*CASSETG*) and growth in other assets (*OASSETG*), Model (2) shows a negative relationship between *OASSETG* and future stock returns that is statistically significant at the 5 percent level. This suggests that growing outside of a firm's core area harms shareholders in the long run. The insignificant relationship between *REG* and future stock performance is also inconsistent with CGS's (2008) finding of a negative coefficient for *Property, Plant and Equipment*. To reconcile the conflicting results, note that our study covers REITs which specialize in real estate ownership while CGS's sample comprises general firms which do not have any specialty skills in managing properties. This finding further suggests that firms which expand out of their core areas are penalized.[17]

On the asset financing side, the regression results in **Table 12** indicate that the aggregate growth in equity capital (*EQUITYG*) and minority interests (*MINORITYG*) does not predict future return performance.[18] To probe deeper, we examine whether growth in common equity (*CEQUITYG*) has the same effect as growth in preferred equity (*PEQUITYG*) in Model (2). In addition, we also decompose growth in common equity into growth in common stock (*CSTOCKG*) and growth in retained earnings (*RETAING*) in Model (3). Overall, we find the average coefficient estimates for the various equity components are insignificant.[19] These results indicate that the adverse effect of asset growth on future REIT

---

[17] Controlling for the mode of payment, Ooi, Ong and Neo (2011) similarly find that the market places a premium on corporate focus in their study on the wealth effects of property acquisitions by a sample of REITs publicly traded in Singapore and Japan.

[18] This is inconsistent with Lougran and Ritter's (1995) finding of firms' long-run negative returns following secondary equity offerings (SEOs). Examining a sample of REIT mergers over the 1994-1998 period, Campbell, Ghosh and Sirmans (2001) find that in stock-financed transactions involving publicly listed targets, the acquiring firm shareholders sustain small negative returns around the announcement date. However, when the targets are privately held, acquirer returns are positive in stock-financed mergers.

[19] To verify the insignificant results, we employ another proxy for equity offerings, namely Daniel and Titman's (2006) issuance variable, where stock issuance is measured as the log growth in split-adjusted shares outstanding in

performance is not driven by growth in equity capital. Moreover, the market does not appear to differentiate between alternative channels of equity expansion, namely preferred equity issues, new common equity issues, or retained earnings.

The regression results reported in Table 12 do show that REITs which fund growth by employing more debt in their capital structure are associated with lower stock returns over the next 12 months. Specifically, the estimated coefficient on growth in total debt (*DEBTG*) is negative and statistically significant at the 10% level in models (1), (2) and (3). Our results are consistent with prior studies on the long-run underperformance associated with debt offerings.[20] To investigate further, we partitioned growth in total debt (*DEBTG*) by its debt maturity and seniority structure. The descriptive statistics reported in Table 10 indicate that secured debt of REITs grew by 3.1% annually, as compared to 2.4% for unsecured debt. Over the same period, long-term debt grew 5.3% annually versus 0.5% annually for short-term debt.

In Model (4), *DEBTG* is decomposed into year-on-year change in short-term debt (*SDEBTG*) and year-on-year change in long-term debt (*LDEBTG*). Short-term debt is defined as loans due within one-year. In Model (5), *DEBTG* is replaced by the year-on-year changes in secured (*SCDEBTG*) and year-on-year change in unsecured debt (*USDEBTG*). Ooi (2000) observed that secured debt plays an important role in reducing borrowing costs as well as expanding the debt capacity of UK property companies.[21] Brown and Riddiough (2003) also conclude that unsecured debt is more costly to issue. To complete the identity on total debt, growth in non-interest bearing debt (*OPLG*) is included in the two models.

The regression results reported in Table 12 for Model (4) and Model (5) show that the

the last three years. The results are consistent.

[20] See Spiess and Affleck-Graves (1999) and Higgins and Howton and Howton (2004) for evidence of long run underperformance of debt offerings by general firms and REITs, respectively.

[21] Secured debtholders have first claim on the pledged assets in the event of a default. If the value of the collateral is less than the amount owed, they rank equally with other creditors for the shortfall with respect to claims on the firm's other unsecured assets (Ooi, 2000). The use of collateral has also been rationalized on the ground that it helps to resolve moral hazard and adverse selection problems (Smith and Warner, 1979; Chan and Thakor, 1987). Financing new projects with secured debt can also help to alleviate the underinvestment problem associated with issuing debt. The cost of borrowing is also lower for secured debt. This allows firms to undertake some projects it would otherwise have to forego if relying on unsecured debt (Stulz and Johnson, 1985).

observed negative relationship between lagged asset growth and subsequent REIT returns appears to be associated primarily with the issuance of unsecured debt, regardless of its maturity. Overall, the results suggest that the provision of collateral associated with secured debt and the refinancing risk associated with debt are effective in restricting REIT managers from engaging in sub-optimal investment activities. Growth in equity capital and its constituents, namely preferred equity, common stock as well as retained earnings, are not able to predict future stock price performance.

7.0 Conclusions

REITs have expanded rapidly in size the last two decades. Some REITs grew aggressively through mergers and portfolio acquisitions, while others focused on development. Although the year-on-year growth rate of REIT assets in our sample averaged 10.8% from 1992 to 2013, the standard deviation was 21.0%. Given the heterogeneity, an interesting question is whether the variation in asset growth can be used as a predictor of the return performance of listed REITs.

We examine the effects of asset growth on stock returns for 308 publicly listed equity REITs from 1993 to 2013. When asset growth is measured as the lagged year-on-year percentage change in total assets, the univariate results show that REIT "hares" tend to underperform REIT "tortoises." The negative relationship between asset growth rate and future return performance is robust to adjusting for firm size and risk. Nevertheless, the asset growth effect is weaker in the REIT market than in general equity markets as reported in prior studies. This muted asset growth effect in the REIT market can be attributed to the stricter regulatory environment in which REITs operate.

The asset growth effect is somewhat muted in our cross-sectional return regression in which we control for standard firm characteristics, including a number of accounting variables that measure recent performance. Nevertheless, the asset growth dominates the effects of conventional return determinants, including firm size, the B/M ratio, and return momentum. Measures of lagged accounting performance, such as the return on assets and changes in working capital, do not predict returns over the next 12 months. In our subsample of firms for which we have estimates of NAV premiums and discounts at the beginning of the year over which asset growth is measured, the negative asset growth effect is stronger. More importantly, we find evidence that the growth effect is significantly less negative for firms selling at a premium to NAV. This is consistent with their cost of capital advantage. Over our full sample, we find weak evidence that apartment and retail REITs outperformed REITs with a focus on other property types and weak evidence that apartment and retail REITs were less susceptible to the negative effects of asset growth. Our regression results are robust to a series of checks, including the addition of accounting performance variables to the regressions, the use of 36-month return horizons, and alternative measures of asset growth.

To isolate the channels driving the relationship between asset growth and return performance, we decompose REIT asset growth into its major components from both the left-hand (investment) side and right-hand (liability) side of the balance sheet. Not surprisingly, REIT growth is driven primarily by the expansion of real estate holdings (92.6%). The growth in financial liabilities is primarily attributable to additional debt (58.3%) and equity (39.8%) capital and, to a smaller extent, changes in minority interests (2.8%).

On the asset side of the balance sheet, the rate of growth in real estate holdings does not appear to significantly affect future return performance. The negative asset growth effect instead appears to be driven by growth in non-core assets. This is consistent with the notion that firms that grow outside of their competency areas are penalized by the market.

On the liability side of the balance sheet, the negative asset growth effect is not driven by growth in firm equity. Moreover, the market does not appear to differentiate between alternative channels of equity expansion, namely preferred equity issues, new common equity issues, or retained earnings. The evidence instead shows that REITs which fund their asset expansion activities by employing more debt in their capital structure are associated with negative stock performance over the next 12 months. Further analysis suggests that the observed negative relationship between lagged growth rate and REIT stock returns appears to be associated primarily with the issuance of unsecured debt to fund the asset growth. This is consistent with the agency cost of debt stories in which the provision of collateral associated with secured debt and the refinancing risk associated with debt restrict managers and shareholders from engaging in sub-optimal investment activities.

References

Agrawal, A., Jaffe, J. F. and Mandelker, G. N. (1992). The Post-Merger Performance of Acquiring Firms: A Re-Examination of an Anomaly. *The Journal of Finance, 47*(4), 1605-1621.

Anderson, C. W. and Garcia-Feijóo, L. (2006). Empirical Evidence on Capital Investment, Growth Options, and Security Returns. *The Journal of Finance, 61*(1), 171-194.

Baker, M. and J. Wurgler. 2006. Investor Sentiment and the Cross-Section of Stock Returns. *Journal of Finance* 61(4), 1645-1680.

Baker, M. and J. Wurgler. 2007. Investor Sentiment in the Stick Market. *Journal of Economic Perspectives* 21, 129-151.

Banz, R. W. (1981). The Relationship between Return and Market Value of Common-Stocks. *Journal of Financial Economics, 9*(1), 3-18.

Berk, J., Green, R. and Naik, V. (1999). Optimal Investment, Growth Options, and Security Returns. *Journal of Finance* 54, 1153-1608.

Boudry, W. I., Kallberg, J. G. and Liu, C. H. (2010). An Analysis of Reit Security Issuance Decisions. *Real Estate Economics,* 38(1), 91-120.

Brown G. and M. Cliff. (2005). Investor Sentiment and Asset Valuation. *Journal of Business* 78(2), 405-440.

Brown, D.T. and Riddiough, T.J. (2003). Financing Choice and Liability Structure of Real Estate Investment Trusts. *Real Estate Economics, 31(3),* 313-346.

Buttimer, R. J., Hyland, D. C. and Sanders, A. B. (2005). Reits, IPO Waves and Long-Run Performance. *Real Estate Economics, 33*(1), 51-87.\

Campbell, R.D., Ghosh, C., and Sirmans, C.F. (2001). The Information Content of Method of Payment in Mergers: Evidence from Real Estate Investment Trusts (REITs). *Real Estate Economics 29(3),* 361-387.

Chan, Y.S. and Thakor, A.V. (1987). Collateral and Competitive Equilibria with Moral Hazard and Private Information. *Journal of Finance, 42(2),* 345-346.

Chui, A. C. W., Titman, S. and Wei, K. C. J. (2003). Intra-Industry Momentum: The Case of Reits. *Journal of Financial Markets, 6*(3), 363-387.

Cooper, M. J., Gulen, H. and Schill, M. J. (2008). Asset Growth and the Cross-Section of Stock Returns. *The Journal of Finance, 63*(4), 1609-1651.

Daniel, K. and Titman, S. (2006). Market Reaction to Tangible and Intangible Information, *Journal of Finance,* 61, 1605–1643.

Fairfield, P. M., Whisenant, J. S. and Yohn, T. L. (2003). Accrued Earnings and Growth: Implications for Future Profitability and Market Mispricing. *The Accounting Review, 78*(1), 353-371.

Fama, E. F. and French, K. R. (1992). The Cross-Section of Expected Stock Returns. *the Journal of Finance, 47*(2), 427-465.

Fama, E. F. and French, K. R. (1993). Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics, 33*(1), 3-56.

Fama, E. F. and French, K. R. (2006). Profitability, Investment and Average Returns. *Journal of Financial Economics, 82*(3), 491-518.

Fama, E. F. and French, K. R. (2008). Dissecting Anomalies. *The Journal of Finance, 63*(4), 1653-1678.

Fama, E. F. and Macbeth, J. D. (1973). Risk, Return, and Equilibrium: Empirical Tests. *The Journal of Political Economy*, 607-636.

Feng, Z., Ghosh, C. and Sirmans, C.F. (2007). On the Capital Structure of Real Estate Investment Trusts. *Journal of Real Estate Finance and Economics, 34(1),* 81-105.

Feng, Z., Price, S. M. and Sirmans, C.F. (2011). An Overview of Equity Real Estate Investment Trusts (Reits): 1993–2009. *Journal of Real Estate Literature, 19*(2), 307-343.

Fu, F., Lin, L. and Officer, M.S. (2013). Acquisitions Driven by Stock Overvaluation: Are They Good Deals? *Journal of Financial Economics, 109,* 24-39.

Gray, P. and Johnson, J. (2011). The Relationship between Asset Growth and the Cross-Section of Stock Returns. *Journal of Banking & Finance, 35*(3), 670-680.

Green Street Advisors (2014). Capital Allocation Roadmap. February 28 (www.greenstreetadvisors.com).

Green Street Advisors (2015). Giving Thanks for Dual Markets. November 25 (www.greenstreetadvisors.com.

Hartzell, J. C., Sun, L. and Titman, S. (2006). The Effect of Corporate Governance on Investment: Evidence from Real Estate Investment Trusts. *Real estate economics, 34*(3), 343-376.

Haugen, R. A. (1996). Commonality in the Determinants of Expected Stock Returns. *Journal of Financial Economics, 41*(3), 401-439.

Higgins, E., Howton, S. and Howton, S. (2004). Shareholder Wealth Effects of Private Placements of Debt Made by Reits. *Briefings in Real Estate Finance, 3*(4), 305-314.

Hirshleifer, D., Hou, K., Teoh, S. H. and Zhang, Y. (2004). Do Investors Overvalue Firms with Bloated Balance Sheets? *Journal of Accounting and Economics, 38*, 297-331.

Jegadeesh, N. and Titman, S. (1993). Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency. *The Journal of Finance, 48*(1), 65-91.

Keim, D. B. (1983). Size-Related Anomalies and Stock Return Seasonality: Further Empirical Evidence. *Journal of Financial Economics, 12*(1), 13-32.

Lakonishok, J., Shleifer, A. and Vishny, R.W. (1994). Contrarian Investment, Extrapolation, and Risk. *Journal of Finance,* 49, 1541-1578.

Ling, D. C. and Naranjo, A. (2015). Returns and Information Transmission Dynamics in Public and Private Real Estate Markets. *Real Estate Economics, 43*(1), 163-208.

Lipson, M. L., Mortal, S. and Schill, M. J. (2011). On the Scope and Drivers of the Asset Growth

Effect. *Journal of Financial and Quantitative Analysis, 46*(6), 1651-1682.

Loughran, T. and Ritter, J. R. (1995). The New Issues Puzzle. *The Journal of Finance, 50*(1), 23-51.

Moeller, S. B., Schlingemann, F. P. and Stulz, R. M. (2005). Wealth Destruction on a Massive Scale? A Study of Acquiring-Firm Returns in the Recent Merger Wave. *Journal of Finance, 60*(2), 757-782.

Olgun, S. (2005). The Performance of Acquisitions in the Real Estate Investment Trust Industry. *Journal of Real Estate Research, 27*(3), 321-342.

Ong, S.E,, Ooi, J.T.L., and Kawaguchi, Y. (2011). Seasoned Equity Issuance by Japan and Singapore REITs. *Journal of Real Estate Finance and Economics, 43,* 205-220.

Ooi, J.T.L. (2000). An Empirical Investigation on the Incidence of Secured Debt. *Journal of Real Estate Finance and Economics, 17(3)*, 185-201.

Ooi, J.T.L., Ong, S.E., and Li, L. (2010). An Analysis of the Financing Decisions of REITs: The Role of Market Timing and Target Leverage. *Journal of Real Estate Finance and Economics, 40, 130-160.*

Ooi, J.T.L., Ong, S.E., and Neo, P.H. (2011). The Wealth Effects of Property Acquisitions: Evidence from Japanese and Singaporean REITs. *Real Estate Economics, 39(3),* 487-505.

Ooi, J.T.L., Webb, J.R., and Zhou, D. (2007). Extrapolation Theory and the Pricing of REIT Stocks. *The Journal of Real Estate Research, 29(1),* 27-55.

Pontiff, J. and Woodgate, A. (2008). Share Issuance and Cross-Sectional Returns. *The Journal of Finance, 63*(2), 921-945.

Rosenberg, B., Reid, K. and Lanstein, R. (1985). Persuasive Evidence of Market Inefficiency. *The Journal of Portfolio Management, 11*(3), 9-16.

Singer, R. J. (1996). Understanding Reits, Upreits, and Down-Reits, and the Tax and Business Decisions Surrounding Them. *Virginia Tax Review, 16*(2), 329.

Sloan, R. (1996). Do Stock Prices Fully Reflect Information in Accruals and Cash Flows About Future Earnings? *Accounting Review, 71*(3), 289-315.

Smith, C.W. and Warner, J.B. (1979). Bankruptcy, Secured Debt, and Optimal Capital Structure. *Journal of Finance, 34(1),* 247-251.

Spiess, D. K. and Affleck-Graves, J. (1999). The Long-Run Performance of Stock Returns Following Debt Offerings. *Journal of Financial Economics, 54*(1), 45-73.

Stulz, R.M. and Johnson, H. (1985). An Analysis of Secured Debt. *Journal of Financial Economics, 14*, 501-521.

Titman, S., Wei, K. C. J. and Xie, F. (2004). Capital Investments and Stock Returns. *Journal of Financial and Quantitative Analysis, 39*(04), 677-700.

Triantis, G. G. (1992). Secured Debt under Conditions of Imperfect Information. *The Journal of Legal Studies*, 225-258.

Yao, T., Yu, T., Zhang, T. and Chen, S. (2011). Asset Growth and Stock Returns: Evidence from Asian Financial Markets. *Pacific-Basin Finance Journal, 19*(1), 115-139.

Figure 1. The number and average size of sampled REITs (by year)

This chart tracks the number and average size of equity REITs publicly traded in the U.S. from year 1992 to 2013. A REIT must be on COMPUSTAT for 2 years before it is included in the sample. The average size of REITs is measured with both the average of total assets and the average of market capitalization of equity.

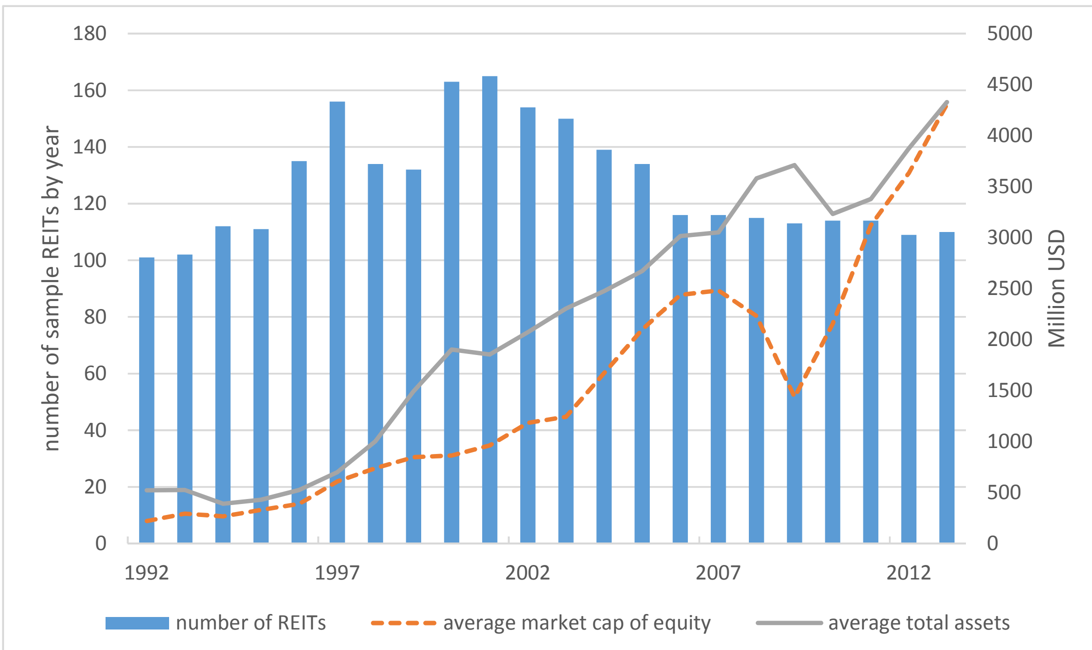


Figure 2. Annual growth rate of individual REITs

This chart tracks the average growth rates of 308 equity REITs publicly traded in the U.S. between 1992 and 2013. A REIT must be on COMPUSTAT for 2 years before it is included in the sample. The growth rate of a REIT is defined as the year-on-year change in total assets.

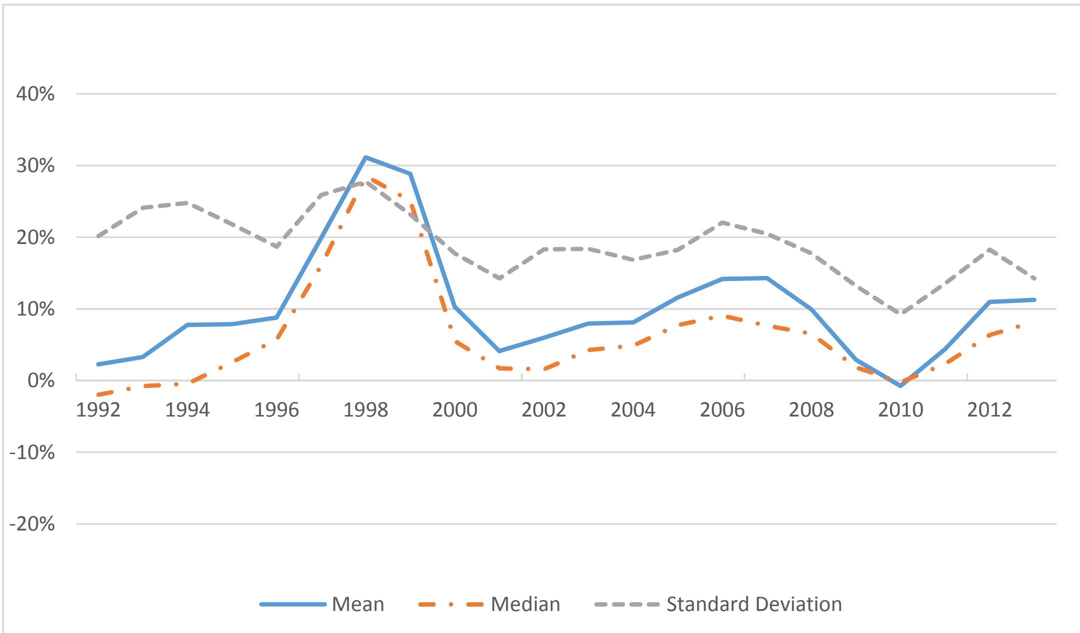
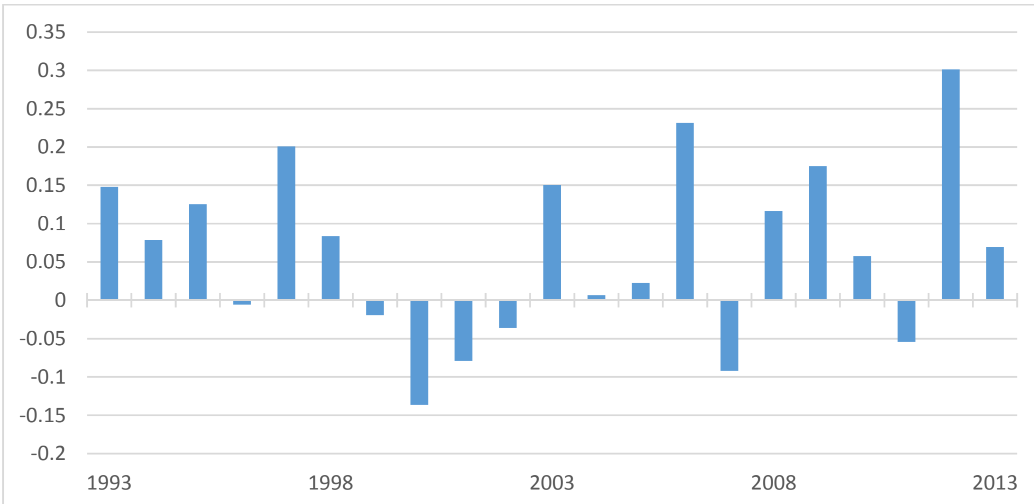


Figure 3. Annual returns of a long-short investment strategy based on asset growth rate

This figure plots the annual returns from buying REIT tortoises (Q1) and simultaneously selling hares (Q5) between 1993 and 2013. The returns for equal-weighted and value-weighted portfolios are reported in Panel A and Panel B, respectively.

Panel A. Hedging returns for equal-weighted portfolios



Panel B. Hedging returns for value-weighted portfolios

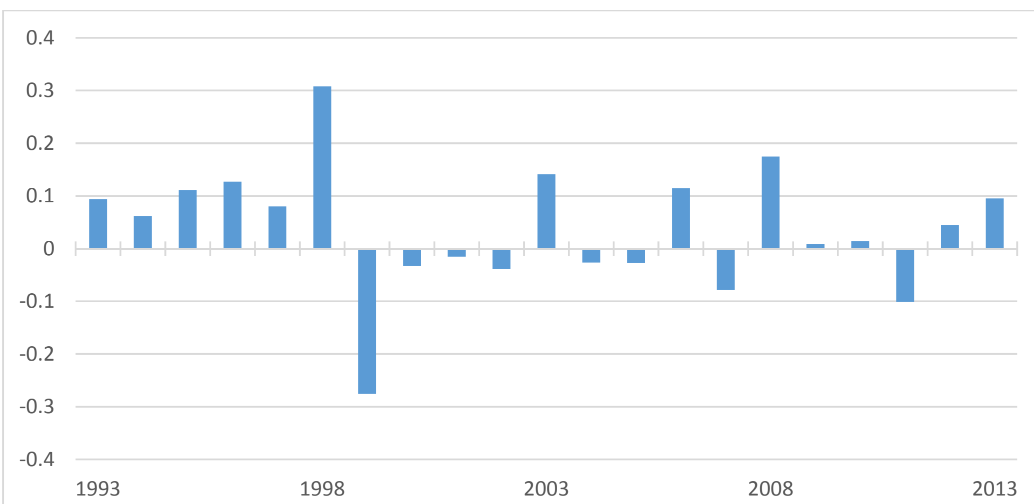


Figure 4. Distribution of Premiums to NAV by year (1993-2013)

This figure plots the distribution of REIT premium to NAV over the sample period from 1993 to 2013. The yearly average of premium/discount to NAV are plotted in solid line. The lower bound and the upper bound of the data are shown in the vertical lines.

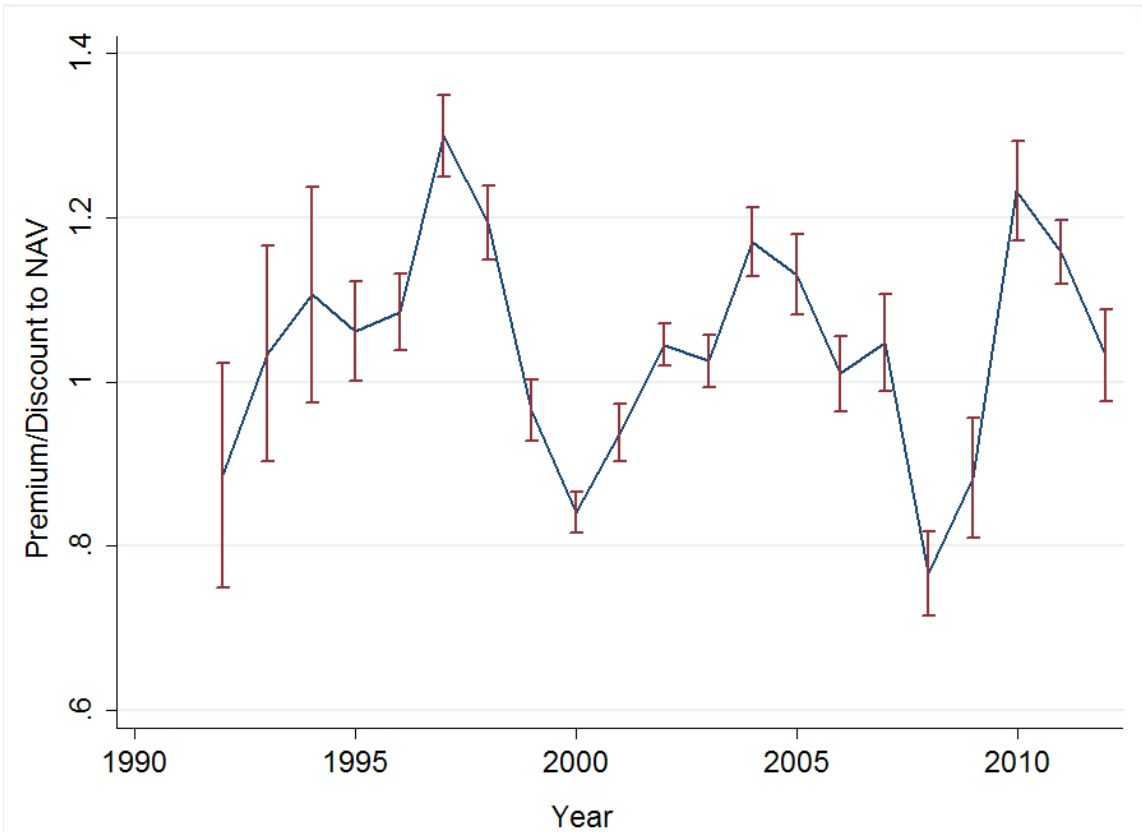


Table 1. Sample Description

This table defines the key attributes and reports their descriptive statistics for our sample of 2,694 REIT-year observations between 1993 and 2013.

Variables	Definition	Mean	Median	Min	Max	S.D
ASSETG	Percentage growth in depreciation-adjusted total assets from end of year t-2 to end of year t-1.	0.108	0.054	-0.366	0.991	0.210
RET1yr	One year buy and hold return from July of year t to June of year t+1.	0.142	0.130	-0.979	3.162	0.317
ASSETS	Total asset ($ million) plus depreciation and amortization at end of year t-1.	2,186	952.1	9.183	21,938	3,576
MV	Market value of equity ($ millions) is computed as the price per share of common equity multiplied by the number of outstanding shares at the end of June of year t.	1,463	564.0	4.341	15,923	2,640
B/M	Book-to-market ratio is defined as the book value of equity divided by the market value of equity at the end June of year t. The book value of equity is computed as the stockholder's equity plus deferred taxes and investment tax credit, if available, less the book value of preferred stock, liquidating value or carrying value at end of year t-1. Market value of equity is as defined above.	0.832	0.649	0.078	5.173	0.726
DEBT	Debt ratio is measured by long-term debt plus current debt, scaled by the total book value of assets at end of year t-1.	0.471	0.490	0.000	0.874	0.194
ROA	Return on total assets is measured by net income plus depreciation and amortization, scaled by total assets at end of year t-1.	0.055	0.058	-0.107	0.209	0.044
BHR11	Buy-and-hold return 11 months prior to portfolio formation in July of year t.	0.134	0.121	-0.979	3.414	0.316
ACCRUALS	Accruals which is represented by the change in operating working capital minus current period depreciation and amortization expenses, scaled by average total assets at end of year t-1.	-0.029	-0.031	-0.211	0.183	0.046
ISSUANCE	Net stock issuance, after adjusting for split shares, from end of year t-2 to end of year t-1.	0.078	0.015	-0.128	1.089	0.158

Table 2. Asset Growth Quintiles: Growth Rate and Financial Characteristics

At the start of July of each year *t* over 1993 to 2013, REITs are grouped into quintile portfolios based on asset growth rate (*ASSETG*) from the fiscal year ending in calendar year *t*-2 to year *t*-1. REIT stocks in the top 20% by asset growth rate are placed in Quintile 5 ("hares"), while those in the bottom 20% are placed in Quintile 1 ("tortoises"). The portfolios are held for 1 year from July of year *t* through June of year t+1, and then reconstructed. Panel A reports average annual growth rates. In Panel A, the Year 0 row reports the asset growth rates from fiscal year *t*-2 to *t*-1, while Year -1, Year-2 and Year-3 report the asset growth rates from fiscal year *t*-3 to *t*-2, *t*-4 to *t*-3, and *t*-5 to *t*-4, respectively. Year +1, Year +2, Year +3, reports the growth rates from fiscal year *t*-1 to *t*, *t* to *t*+1, and *t*+1 to *t*+2. Panel B reports the financial characteristics of the REITs at the end of the fiscal year prior to the portfolio formation date. The variables as defined in Table 1. The spread between Quintile 5 and Quintile 1 are also reported. *, **, and *** represent significance of the spread at the 10%, 5%, and 1%, respectively.

Asset Growth Portfolios:	1 ("tortoises")	2	3	4	5 ("hares")	Spread (5-1)	t-stats	
Panel A: Asset Growth Rates								
Year 0	-0.099	0.012	0.073	0.163	0.401	0.500	48.40	***
Before portfolio construction								
Year -3	0.062	0.108	0.124	0.143	0.148	0.087	5.72	***
Year -2	0.050	0.100	0.126	0.143	0.166	0.116	7.77	***
Year -1	0.015	0.070	0.116	0.180	0.209	0.194	14.04	***
After portfolio construction								
Year +1	-0.012	0.060	0.099	0.132	0.187	0.199	15.74	***
Year +2	0.003	0.058	0.096	0.127	0.144	0.141	10.39	***
Year +3	0.037	0.068	0.090	0.105	0.122	0.086	5.84	***
Panel B: Financial Characteristics								
ASSETS	1,965	2,310	2,324	2,198	2,147	182	0.82	
MV	1,161	1,486	1,605	1,586	1,491	330	2.06	**
B/M	1.086	0.873	0.783	0.711	0.698	-0.388	-8.15	***
DEBT	0.462	0.456	0.469	0.493	0.479	0.017	1.39	
ROA	0.037	0.059	0.063	0.059	0.057	0.020	6.16	***
BHR11	0.118	0.148	0.117	0.135	0.151	0.033	1.53	
ACCRUALS	-0.036	-0.032	-0.028	-0.026	-0.021	0.015	4.32	***
ISSUANCE	0.043	0.033	0.045	0.082	0.188	0.145	12.62	***

Table 3. Asset Growth Portfolios: Returns

This table presents REIT stock returns across five quintiles sorted by their asset growth rate (*ASSETG*) in the preceding year. The bottom 20% of the REITs ranked by asset growth rate are placed in Quintile 1 ("tortoises"), while the top 20% of the REITs by asset growth rate are placed in Quintile 5 ("hares"). The buy-and-hold returns for 1, 2, 3, 4 and 5 years holding period are computed. Year 1 refers to July of year *t* through June of year *t+1*. The raw returns for the equally-weighted (EW) portfolios are reported in Panel A, while the corresponding returns for the value-weighted (VW) portfolios are reported in Panel B. The size-adjusted returns of the portfolios are reported in Panel C which first involves constructing five portfolios of REITs each year based on their market capitalization (in June of the previous year). The EW returns for each portfolio are then computed. The market-adjusted return of the asset growth portfolios equals to their EW returns minus the corresponding size-quintile returns. T-statistic and statistical significance is reported for spread in the values of Q1 and Q5 portfolios. *, **, and *** represent significance at the 10%, 5%, and 1%, respectively.

Asset Growth Portfolios:	1 ("tortoises")	2	3	4	5 ("hares")	Spread (5-1)	t-stats
Panel A: Equally-weighted (EW) Returns							
Return [0,1]	0.1855	0.1507	0.1521	0.1402	0.1215	-0.0640	-2.56 **
Return [0,2]	0.4048	0.3446	0.3299	0.2996	0.2728	-0.1320	-3.34 ***
Return [0,3]	0.6105	0.5917	0.5200	0.4880	0.3958	-0.2148	-4.13 ***
Return [0,4]	0.8130	0.8890	0.7270	0.7118	0.5482	-0.2648	-4.12 ***
Return [0,5]	1.1184	1.0978	0.9137	0.8897	0.6781	-0.4402	-5.23 ***
Panel B. Value-weighted (VW) Returns							
Return [0,1]	0.1680	0.1486	0.1450	0.1139	0.1309	-0.0371	-1.42
Return [0,2]	0.3180	0.3245	0.3004	0.2710	0.2675	-0.0505	-1.28
Return [0,3]	0.4824	0.5168	0.4880	0.4396	0.3972	-0.0853	-1.50
Return [0,4]	0.6278	0.7246	0.7110	0.6264	0.5496	-0.0782	-1.07
Return [0,5]	0.8469	0.8787	0.8466	0.8014	0.6512	-0.1957	-1.96 **
Panel C. Market-Adjusted Returns							
Return [0,1]	0.0198	-0.0033	0.0009	-0.0057	-0.0201	-0.0399	-2.22**
Return [0,2]	0.0483	-0.0015	0.0010	-0.0057	-0.0285	-0.0767	-2.89***
Return [0,3]	0.0515	0.0222	0.0119	0.0016	-0.0576	-0.1091	-3.46***
Return [0,4]	0.0476	0.0531	0.0086	0.0130	-0.0677	-0.1153	-3.72***
Return [0,5]	0.0977	0.0383	-0.0017	0.0255	-0.0790	-0.1767	-4.55***

Table 4. Asset Growth Portfolios: Risk-adjusted Returns

This table presents the risks as well as risk-adjusted performance of REITs across five quintiles sorted by their asset growth rate (*ASSETG*) in the preceding year. The bottom 20% of the REITs ranked by asset growth rate are placed in Quintile 1 ("tortoises"), while the top 20% of the REITs by asset growth rate are placed in Quintile 5 ("hares"). The constructed portfolios are held for 1 year from July of year *t* through June of year *t+1* and then reconstructed. Two risk measures are reported in Panel A, namely the standard deviation of the monthly returns and 3-factor beta of the respective portfolios. Two risk-adjusted performance are reported in Panel B, namely Sharpe ratio and 3-factor alpha. The risk-adjusted performance over a longer horizon, namely three years, is also computed. T-statistic and statistical significance is reported for spread in the values of Q1 and Q5 portfolios. *, **, and *** represent significance at the 10%, 5%, and 1%, respectively.

Asset Growth Portfolios:	1 ("tortoises")	2	3	4	5 ("hares")	Spread (5-1)	t-stats
Panel A: Monthly Returns Volatility							
Standard deviation	0.055	0.055	0.051	0.056	0.054	0.001	1.04
3-factor beta	0.823	0.770	0.700	0.740	0.705	-0.117	-1.52
Panel B. Risk-Adjusted Monthly Returns							
1-year holding period							
Sharpe ratio	0.221	0.179	0.195	0.162	0.142	-0.080	-1.87*
3-factor alpha	0.004	0.002	0.003	0.001	0.000	-0.004	-1.72*
3-year holding period							
Sharpe ratio	0.209	0.252	0.189	0.178	0.101	-0.109	-2.59**
3-factor alpha	0.004	0.006	0.003	0.002	-0.002	-0.006	-2.08**

Table 5. Comparing Sub-Samples of REITs with and without P/NAV Data

This table provides the summary statistics for two groups: (1) REITs with P/NAV data, and (2) REITs without P/NAV data. In total, we have 865 REIT-year observations for Group 1 (G1) and 1,829 REIT-year observations for Group 2 (G2). The variables are defined in Table 1. The last two columns report the differences in the means of the two sub-samples (G1-G2) and associated t-statistics. *, **, and *** represent significance at the 10%, 5%, and 1%, respectively.

	Panel A: Sub-sample of REITs with P/NAV Data (G1)				Panel B: Sub-sample of REITs without P/NAV Data (G2)				Differences in Means Test		
Variables	Mean	Median	S.D	N	Mean	Median	S.D	N	(G1 - G2)	t-stats	
ASSETG	0.125	0.071	0.184	865	0.100	0.042	0.220	1,829	0.025	3.02	***
RET1yr	0.144	0.147	0.257	865	0.141	0.122	0.342	1,829	0.004	0.32	
ASSETS	3,875	2,551	4,430	865	1,387	573.9	2752	1,829	2,488	15.19	***
MV	2,636	1,479	3,395	865	908	288	1,966	1,829	1,728	13.91	***
B/M	0.588	0.529	0.371	865	0.948	0.719	0.818	1,829	-0.360	-15.72	***
DEBT	0.514	0.518	0.151	865	0.452	0.472	0.209	1,829	0.062	8.76	***
ROA	0.059	0.060	0.030	865	0.053	0.056	0.049	1,829	0.006	3.95	***
BHR_{11}	0.138	0.127	0.271	865	0.132	0.115	0.336	1,829	0.006	0.49	
ACCRUALS	-0.031	-0.033	0.024	865	-0.027	-0.029	0.053	1,829	-0.004	-2.65	***
ISSUANCE	0.078	0.031	0.122	865	0.078	0.010	0.172	1,829	-0.001	-0.10	

Table 6. Descriptive Statistics of REITs trading at Premium, around, and Discount to NAV

This table provides the summary statistics for three separate groups of REITs that trade at: (1) premium to NAV (P/NAV>1.03), (2) around NAV (0.97< P/NAV <1.03), and (3) discount to NAV (P/NAV<0.97). Green Street provides data on monthly premium to NAV. To match annual asset growth, P/NAV at the beginning of the prior year is used. In total we have 865 REIT-year observations with P/NAV data, comprising 431, 127 and 307 REIT-year observations for those trading at premium to NAV (G1), price around NAV (G2), and discount to NAV (G3), respectively. The last two columns report the differences in the means of the two extreme sub-samples (G1-G3) and associated t-statistics. *, **, and *** represent significance at the 10%, 5%, and 1%, respectively.

	Sub-sample of REITs trading at Premium to NAV (G1)			Sub-sample of REITs trading around NAV (G2)			Sub-sample of REITs trading at Discount to NAV (G3)			Differences in Means Test (G1-G3)		
Variables	**Mean**	**Median**	**S.D**	**Mean**	**Median**	**S.D**	**Mean**	**Median**	**S.D**	**Diff.**	**t-stat.**	
ASSETG	0.185	0.144	0.196	0.099	0.052	0.167	0.050	0.022	0.138	0.135	10.94	***
RET1yr	0.109	0.116	0.199	0.147	0.186	0.229	0.192	0.197	0.325	-0.083	-3.98	***
ASSETS	4,201	2,613	4,720	4,142	2,598	4,866	3,308	2,360	3,723	893	2.87	***
MV	3,393	1,807	3,956	2,466	1,539	3,120	1,643	1,036	2,174	1,749	7.69	***
B/M	0.499	0.458	0.250	0.576	0.521	0.284	0.716	0.621	0.489	-0.217	-7.13	***
DEBT	0.491	0.500	0.153	0.536	0.535	0.119	0.536	0.534	0.155	-0.045	-3.88	***
ROA	0.062	0.060	0.029	0.058	0.058	0.029	0.055	0.059	0.032	0.006	2.80	***
BHR_{11}	0.151	0.137	0.182	0.118	0.088	0.204	0.129	0.121	0.377	0.023	0.97	
ACCRUALS	-0.030	-0.033	0.024	-0.032	-0.035	0.025	-0.033	-0.033	0.025	0.003	1.45	
ISSUANCE	0.096	0.058	0.115	0.078	0.025	0.123	0.052	0.010	0.128	0.044	4.81	***

Table 7. Cross-Section Regressions Results (July 1993 – June 2014)

This table shows the average slopes and t-stats from annual cross-section regressions on REIT stock returns from July 1993 to June 2014. The dependent variable is the 12-month stock returns from July of year *t* to June of year *t+1*. The explanatory variables are defined in Table 1. *ASSETG* is defined as the percentage growth in depreciation-adjusted total assets from end of year t-2 to end of yeart-1. Model (1) and Model (2) are the base and extended regression models using the full sample of 1,364 observations, while models (3), (4), (5) and (6) are estimated using the subsample of REITs for which Green Street NAV premiums and discounts were available. *NAVPREM* is equal to one if P/NAV > 1.03, and zero otherwise. *NAVDIS* is equal to one if P/NAV < 0.97, and zero otherwise. *ASSETG*NAVPREM* and *ASSETG*NAVDIS* are interaction variables. The t-stats for the average regression slopes are reported in parenthesis. *, **, and *** represent significance at the 10%, 5%, and 1%, respectively.

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
ASSETG	-0.0765*	-0.0792*	-0.0462	-0.0364	-0.419**	-0.660**
	(-1.931)	(-1.754)	(-1.207)	(-0.626)	(-2.479)	(-2.228)
MV	-0.00448	-0.00551	-0.00443	-0.00152	0.0103	0.00753
	(-1.020)	(-1.398)	(-0.674)	(-0.205)	(0.850)	(0.728)
B/M	0.00926	0.00620	9.37e-05	-0.00401	0.00374	-0.00767
	(0.655)	(0.398)	(0.00568)	(-0.172)	(0.182)	(-0.336)
BHR_{11}	0.0486	0.0573	0.170**	0.143**	0.166**	0.154**
	(1.129)	(1.562)	(2.424)	(2.518)	(2.277)	(2.250)
ROA		0.217		0.0104		0.164
		(1.043)		(0.0300)		(0.427)
ACCRUALS		0.291		0.220		0.404
		(1.379)		(0.643)		(1.064)
ISSUANCE		0.00687		-0.0355		-0.0169
		(0.121)		(-0.492)		(-0.267)
NAVDIS					0.0246	0.00455
					(0.837)	(0.178)
NAVPREM					-0.0418	-0.0575
					(-1.267)	(-1.438)
ASSETG ×NAVDIS					0.247	0.601
					(0.688)	(1.326)
ASSETG ×NAVPREM					0.330**	0.579**
					(2.764)	(2.343)
Constant	0.161***	0.167***	0.131**	0.0600	-0.0272	0.00883
	(4.179)	(3.790)	(2.502)	(0.777)	(-0.285)	(0.0955)
Property Type Fixed Effects	Y	Y	Y	Y	Y	Y
Observations	2,694	2,694	865	865	865	865
Avg_Adj.R2	0.0713	0.200	0.0811	0.267	0.275	0.308

Table 8. Cross-Section Regressions Results (July 1993-June 2003)

This table shows the average slopes and t-stats from annual cross-section regressions on REIT stock returns from July 1993 to June 2003. The dependent variable is the 12-month stock returns from July of year *t* to June of year *t+1*. The explanatory variables are defined in Table 1. *ASSETG* is defined as the percentage growth in depreciation-adjusted total assets from end of year t-2 to end of yeart-1. Model (1) and Model (2) are the base and extended regression models using the full sample of 1,364 observations, while models (3), (4), (5) and (6) are estimated using the subsample of REITs for which Green Street NAV premiums and discounts were available. *NAVPREM* is equal to one if P/NAV > 1.03, and zero otherwise. *NAVDIS* is equal to one if P/NAV < 0.97, and zero otherwise. *ASSETG*NAVPREM* and *ASSETG*NAVDIS* are interaction variables. The t-stats for the average regression slopes are reported in parenthesis. *, **, and *** represent significance at the 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
ASSETG	-0.00790	-0.0262	-0.0434	-0.0697	-0.244	-0.365
	(-0.143)	(-0.489)	(-0.949)	(-1.612)	(-1.265)	(-1.728)
MV	-0.00970	-0.00707	-0.0125	-0.0125	0.00604	0.000648
	(-1.578)	(-1.233)	(-1.737)	(-1.639)	(0.305)	(0.0409)
B/M	-0.00417	-0.00130	-0.0319	-0.0368*	-0.0238	-0.0379*
	(-0.242)	(-0.0642)	(-1.747)	(-1.872)	(-1.791)	(-2.010)
BHR_{11}	0.0893**	0.0795*	0.221**	0.169***	0.142*	0.141*
	(2.366)	(2.056)	(3.091)	(3.667)	(1.853)	(1.944)
ROA		0.290		-0.455*		-0.399
		(1.010)		(-1.857)		(-1.322)
ACCRUALS		0.206		-0.0129		0.247
		(1.089)		(-0.0340)		(0.677)
ISSUANCE		-0.0254		-0.0951*		-0.0666
		(-0.405)		(-2.171)		(-1.738)
NAVDIS					0.0743	0.0438
					(1.573)	(1.065)
NAVPREM					0.0116	0.0107
					(0.364)	(0.351)
ASSETG ×NAVDIS					-0.144	0.0224
					(-0.329)	(0.0499)
ASSETG ×NAVPREM					0.195	0.252
					(1.255)	(1.462)
Constant	0.179***	0.126*	0.158*	0.0714	-0.105	-0.0438
	(4.344)	(1.897)	(2.040)	(0.770)	(-0.662)	(-0.332)
Prop. Type Fixed Effects	Y	Y	Y	Y	Y	Y
Observations	1,364	1,364	380	380	380	380
Avg_Adj.R2	0.0492	0.182	0.0595	0.210	0.247	0.271

Table 9. Cross-Section Regressions Results (July 2003-June 2014)

This table shows the average slopes and t-stats from annual cross-section regressions on REIT stock returns from July 2003 to June 2014. The dependent variable is the 12-month stock returns from July of year *t* to June of year *t+1*. The explanatory variables are defined in Table 1. *ASSETG* is defined as the percentage growth in depreciation-adjusted total assets from end of year t-2 to end of yeart-1. Model (1) and Model (2) are the base and extended regression models using the full sample of 1,364 observations, while models (3), (4), (5) and (6) are estimated using the subsample of REITs for which Green Street NAV premiums and discounts were available. *NAVPREM* is equal to one if P/NAV > 1.03, and zero otherwise. *NAVDIS* is equal to one if P/NAV < 0.97, and zero otherwise. *ASSETG*NAVPREM* and *ASSETG*NAVDIS* are interaction variables. The t-stats for the average regression slopes are reported in parenthesis. *, **, and *** represent significance at the 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
ASSETG	-0.139**	-0.127*	-0.0487	-0.00619	-0.578*	-0.929
	(-3.109)	(-1.906)	(-0.828)	(-0.0593)	(-2.221)	(-1.809)
MV	0.000269	-0.00409	0.00287	0.00846	0.0142	0.0138
	(0.0423)	(-0.662)	(0.282)	(0.766)	(0.923)	(0.990)
B/M	0.0215	0.0130	0.0292	0.0258	0.0288	0.0199
	(0.929)	(0.537)	(1.265)	(0.692)	(0.838)	(0.537)
BHR_{11}	0.0115	0.0372	0.123	0.120	0.188	0.165
	(0.153)	(0.598)	(1.035)	(1.185)	(1.502)	(1.421)
ROA		0.151		0.433		0.677
		(0.489)		(0.747)		(1.089)
ACCRUALS		0.368		0.431		0.546
		(0.994)		(0.781)		(0.834)
ISSUANCE		0.0362		0.0187		0.0284
		(0.386)		(0.144)		(0.249)
NAVDIS					-0.0205	-0.0311
					(-0.805)	(-1.359)
NAVPREM					-0.0904*	-0.120*
					(-1.888)	(-1.969)
ASSETG×NAVDIS					0.603	1.128
					(1.161)	(1.638)
ASSETG×NAVPREM					0.453**	0.877*
					(2.689)	(2.118)
Constant	0.144**	0.205***	0.106	0.0496	0.0433	0.0567
	(2.237)	(3.710)	(1.290)	(0.369)	(0.375)	(0.424)
Prop. Type Fixed Effect	Y	Y	Y	Y	Y	Y
Observations	1,330	1,330	485	485	485	485
Avg_Adj.R2	0.0915	0.217	0.101	0.318	0.301	0.341

Table 10. Decomposition of Asset Growth Rates

This table presents descriptive statistics for growth of various components from the investment side (Panel A) and financing si variables are updated at end of June of year t using accounting information on changes in an item from end of year *t-2* to end of y year *t-2*. The variables have been winsorized at 1% and 99% percentiles.

Panel A. Decomposition of *ASSETG* By Investment Structure

		Mean	Median
<u>Asset Investment</u>			
REG	Year-on-year change in real estate assets scaled by depreciation adjusted total assets.	0.101	0.045
NONREG	Year-on-year change in non-real estate assets scaled by depreciation adjusted total assets.	0.008	0.004
<u>Non-Real Estate Asset Structure</u>			
CASHG	Change in cash and short-term investment scaled by depreciation adjusted total assets.	0.003	0.000
CASSETG	Change in current assets other than cash scaled by depreciation adjusted total assets. Non-cash current assets equal total current assets minus cash and short-term investment.	0.003	0.000
OASSETG	Change in assets that are not real estate assets nor current assets scaled by depreciation adjusted total assets. Other assets are defined as COMPUSTAT other assets plus intangibles.	0.004	0.002

Panel B. Decomposition of *ASSETG* by Financing Structure

		Mean	Median	Min	Max	S. D	Obs.
Asset Financing							
DEBTG	Year-on-year change in total liabilities scaled by depreciation adjusted total assets.	0.063	0.032	-0.323	1.075	0.148	2694
EQUITYG	Year-on-year change in equity capital scaled by depreciation adjusted total assets.	0.043	0.011	-0.178	0.958	0.110	2694
MINORITYG	Year-on-year change in minority interests scaled by depreciation adjusted total assets.	0.003	0.000	-0.053	0.200	0.022	2694
Debt Structure							
SDEBTG	Year-on-year change in short-term debt (due within one year, including the current portion of long-term debt) scaled by depreciation adjusted total assets.	0.005	0.000	-0.223	0.269	0.067	1958
LDEBTG	Year-on-year change in long-term debt scaled by depreciation adjusted total assets.	0.053	0.027	-0.333	0.986	0.144	2694
SCDEBTG	Year-on-year change in secured debt scaled by depreciation adjusted total assets.	0.031	0.000	-0.323	0.839	0.124	2570
USCDEBTG	Year-on-year change in unsecured debt scaled by depreciation adjusted total assets.	0.024	0.001	-0.232	0.454	0.094	1855
OPLG	Year-on-year change in operating liability other than debts scalded by depreciation adjusted total assets. Liabilities other than debts include the non-debt part of current liabilities plus deferred taxes plus other liabilities.	0.006	0.003	-0.200	0.295	0.045	1958
Equity Structure							
PEQUITYG	Year-on-year change in preferred equity scaled by depreciation adjusted total assets.	0.005	0.000	-0.051	0.173	0.026	2694
CEQUITYG	Year-on-year change in common equity scaled by depreciation adjusted total assets.	0.038	0.009	-0.177	1.170	0.106	2694
Common Equity Structure							
CSTOCKG	Year-on-year change in stock financing scaled by depreciation adjusted total assets. Stock financing is defined as common stock minus retained earnings.	0.047	0.007	-0.107	1.041	0.099	2806
RETAING	Year-on-year change in retained earnings plus depreciation and amortization ($data14$ if available, or scaled by depreciation adjusted total assets.	-0.009	-0.006	-0.161	0.162	0.037	2806

Table 11. Regression Results – Decomposition of Asset Growth by the Investing Channels

This table shows the average slopes and t-stats from annual cross-section regressions on REIT stock returns from July 1993 to June 2014 by decomposing *ASSETG* into the different components of assets held by the individual REITs. In Model (1), *ASSETG* is decomposed into growth in real estate assets (*REG*) and growth in non-real estate assets (*NONREG*). In Model 2, *NONREG* is further decomposed into growth in cash (*CG*), growth in current assets (*CASSETG*), and growth in other assets (*OASSETG*). Description of the decomposed variables are provided in Panel A of Table 10. The dependent variable is the 12-month stock returns from July of year *t* to June of year *t+1*. The coefficients for the property-type fixed effects, *MV, B/M, BHR11, ROA, ACCRUALS*, and *ISSUANCE,* although included in the regression models, are not reported. The t-stats for the average regression slopes are reported in parenthesis. *, **, and *** represent significance at the 10%, 5%, and 1%, respectively.

	(1)	(2)
REG	0.0216	0.0545
	(0.530)	(1.097)
NONREG	-0.221	
	(-1.453)	
CASHG		-0.0754
		(-0.377)
CASSETG		-0.328
		(-0.718)
OASSETG		-1.185**
		(-2.436)
Constant	0.150***	0.161***
	(3.120)	(3.418)
Property Type Fixed Effects	Y	Y
Observations	2,694	2,694
Avg_Adj.R2	0.208	0.236

Table 12. Regression Results – Decomposition of Asset Growth by the Financing Channels

This table shows the average slopes and t-stats from annual cross-section regressions on REIT stock returns from July 1993-June 2014 by decomposing *ASSETG* into the different financing channels. In Model (1), *ASSETG* is decomposed into change in equity capital (*EQUITYG*), debt capital (*DEBTG*) and minority interests (*MINORITYG*). In Model (2), *EQUITYG* is further differentiated into growth in common equity (*CEQUITYG*) and growth in preferred equity (*PEQUITYG*). In Model (3), *CEQUITYG* is broken into change in common stock (*CSTOCKG*) and change in retained earnings (*RETAING*). On the debt-side, Model (4) and Model (5) split *DEBTG* into year-on-year change in short-term debt (*SDEBTG*) and long-term debt (*LDEBTG*); and year-on-year change in secured debt (*SCDEBTG*) and unsecured debt (*USCDEBTG*), respectively. Model Description of the decomposed variables are provided in Panel B of Table 10. The dependent variable is the 12-month stock returns from July of year t to June of year t+1. The coefficients for the property-type fixed effects, *MV*, *B/M*, *BHR11*, *ROA*, *ACCRUALS*, and *ISSUANCE* are not reported. The t-stats for the average regression slopes are in parenthesis. *, **, and *** represent significance at the 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)
EQUITYG	0.0321			-0.0747	-0.0671
	(0.300)			(-0.755)	(-0.625)
CEQUITYG		-0.00333			
		(-0.0315)			
CSTOCKG			-0.0167		
			(-0.138)		
RETAING			0.0267		
			(0.144)		
PEQUITYG		-0.317	-0.466		
		(-0.601)	(-0.935)		
DEBTG	-0.105*	-0.103*	-0.103*		
	(-1.934)	(-1.934)	(-1.791)		
SDEBTG				-0.225*	
				(-1.799)	
LDEBTG				-0.108*	
				(-1.809)	
SCDEBTG					-0.0772
					(-0.874)
USCDEBTG					-0.147**
					(-2.227)
OPLG				-0.399	-0.292
				(-1.580)	(-1.187)
MINORITYG	0.0186	0.238	0.204	0.508	0.332
	(0.0349)	(0.432)	(0.369)	(1.021)	(0.556)
Constant	0.182***	0.178***	0.181***	0.182***	0.196***
	(4.029)	(3.871)	(3.752)	(3.546)	(4.210)
Property Type Fixed Effets	Y	Y	Y	Y	Y
Observations	2,694	2,694	2,694	1,958	1,855
Avg_Adj.R2	0.202	0.201	0.200	0.228	0.227