

REIT and Commercial Real Estate Returns: A Post Mortem of the Financial Crisis*

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Abstract

In the years surrounding the financial crisis, the share prices of equity Real Estate Investment Trusts (REITs) were much more volatile than the underlying commercial real estate prices. To better understand this phenomenon we examine the cross-sectional dispersion of REIT returns during this time period with a particular focus on the influence of their capital structures. By looking at both the debt ratio and the maturity structure of the debt we separate the pure leverage effect from the effect of financial distress. Consistent with leverage and financial distress costs amplifying the price decline, we find that the share prices of REITs with higher debt to asset ratios and shorter maturity debt fell more during the 2007 to early 2009 crisis period. Although REIT prices rebounded with the bounce back in commercial real estate prices, financial distress costs had a permanent effect on REIT values. In particular, we find that REITs with more debt due during the crisis period tended to sell more property and issue more equity in 2009, when prices were depressed.

Keywords: Real Estate Investment Trust, REIT, Leverage, Debt Maturity, Financial Distress, Financial Crisis

JEL Classifications: G10, G23, G32

1. Introduction

In the years surrounding the financial crisis, the share prices of equity Real Estate Investment Trusts (REITs) were extremely volatile. The NAREIT All Equity REITs Index fell from a high of 10,256 in January 2007 to a low of 3,337, in February 2009, a cumulative loss of 67%, with the largest fall of 60% between September 2008 and February 2009. The index subsequently recovered much of the loss in value, closing at 9,039 at the end of December 2011.

[Insert Figure 1 here]

As illustrated in Figure 1, the NAREIT index was substantially more volatile than the NCREIF Property index over this time period. For example, over the period September 2008 to February 2009 the NCREIF Property Index only fell by 15% in comparison to the 60% fall in the NAREIT index. With respect to the subsequent reversal, the NCREIF Property Index fully recovered the loss by December 2011, but the NAREIT index was still 10% below its pre-crisis high.

Finally, as we show in Figure 2, the magnitude of the price changes were different for different property types. Residential REITs were particularly volatile in this time period; from January 2007 to February 2009 residential REITs fell 53% and then recovered 90% of its previous value over the period February 2009 to December 2011.¹ In comparison, industrial REITs fell by only 40% but recovered only 31% of its value over the period February 2009 to December 2011.

[Insert Figure 2 here]

¹ Over the same period the NCREIF Residential Index only fell by 24% and had fully recovered its value by December 2011.

The question that we address in this paper is why REIT prices, both generally and within specific sectors, were so much more volatile during the financial crisis than the underlying commercial real estate. There are a number of possible explanations. Of course, part of the reason that REIT prices reacted more to the financial crisis than the underlying commercial real estate is because REITs are leveraged investments. However, as illustrated in Figure 1, the leverage-adjusted returns of REITs are also much more volatile than the NCREIF index, suggesting that a pure leveraging of returns cannot be the whole story.

Another possibility is that the NCREIF index, being based on appraisals, is both slow to react and tends to underreact to major price changes. We know that this is at least part of the story and the fact that the NCREIF index turned down 6-quarters after the NAREIT index and then rebounded with a 6 quarter delay, as evidenced in Figure 1, is suggestive of this. It is also possible that the NAREIT index tends to overreact to changes in property prices. Whether or not this is true, in general, is controversial, and is beyond the scope of this study. However, given the subsequent reversal, one can argue that REITs did in fact overreact in this particular case.

It should also be noted that the values of REITs represent more than just their underlying properties, so it is possible for their values to decline much more than the values of their underlying properties, even after accounting for their debt obligations. Specifically, many of them have large pipelines of development deals as well as platforms that allow them to exploit positive net present value opportunities in the future. It is likely that during the financial crisis the perceived values of those opportunities evaporated or even turned negative. However, because these growth opportunities represent a small part of REIT values, even in good times, we expect that fluctuations in the ability to exploit the growth opportunities probably played only

a small role in the decline and rebound of REITs during this period.

Another possibility is that the riskiness of REITs dramatically increased around the crisis period, causing REIT prices to decline, as required rates of return increased. As shown in Figure 3, REIT betas did increase substantially in the crisis period, suggesting that this could explain at least part of the decline. However, the increase in the betas of REITs should be related to the underlying risk of commercial real estate in general, not just the REITs, and as such, cannot explain why REITs declined more in the crash than the underlying real estate. In addition, the fact that REIT betas stayed high did not seem to dampen the subsequent rebound.

[Insert Figure 3 here]

The analysis in this paper focuses on the financial leverage explanation, but our analysis goes beyond the simple amplification effect of corporate debt. In particular, we will consider the potential financial distress costs that arise for those REITs that are unable to meet their debt obligations. Specifically, we will consider the possibility that a combination of a downturn and high leverage can lead to increases in general administrative expenses, losses of growth opportunities, and losses associated with being forced to either raise capital or sell properties at unattractive terms. An analysis of these potential financial distress costs is the central focus of our analysis.

By looking at the maturity structure of the debt as well as the debt ratio, we are able to separate the amplification effect of leverage from the effect of financial distress. The maturity of the debt is not relevant for the amplification effect – in the absence of financial distress, short term and long term debt will similarly amplify the price changes of the underlying properties.

However, because of added costs associated with rolling over maturing debt in bad times, REITs that had significant amounts of debt coming due during the financial crisis were clearly disadvantaged relative to REITs with the same debt to asset ratios but with longer duration debt.²

To explore these issues we examine the cross-section of cumulative REIT returns in two separate time periods; the January 2007 to February 2009 time period, when REIT prices collapsed, and the March 2009 to December 2011 period; the rebound period. Consistent with the amplification effect, we find that after controlling for property type and other REIT characteristics, the share prices of REITs with higher debt to asset ratios fell more during the initial time period. In addition, controlling for the total debt to asset ratio, REITs with shorter maturity debt (debt due in two or three years and variable interest rate debt) experienced larger price declines during the January 2007 to February 2009 time period, suggesting that a significant part of the declines were due to concerns about the financial distress costs that arise because of rollover risk. Further, we find that these effects hold over the full January 2007 to December 2011 sample period, suggesting that financial distress had a permanent effect on these REITs even though very few went bankrupt.³

To further explore the impact of financial distress costs, we examine whether firms with debt due in two or three years following 2006 adjust their behavior in a manner that can dilute the value of existing shares. In particular, we examine how their capital structures influence whether they raise equity capital or sell properties during the distress period. Consistent with an increase in financial distress costs, we find that after controlling for property type and other REIT characteristics, including the total debt to asset ratio, REITs with shorter maturity debt

² Diamond (1991, 1993) provided the earliest analysis of rollover risk. More recently, Acharya, Gale and Yorulmazer (2011), Choi, Hackbarth and Zechner (2012) and He and Xiong (2012) discuss these issues in the context of the recent shock to the financial system.

³ Both General Growth and Innkeepers files for Chapter 11 bankruptcy protection during our sample period; General Growth in 2009 and Innkeepers in 2010.

(debt due in two or three years) raised relatively more equity capital and sold more properties (sales exceeded acquisitions) in 2009.⁴

The paper is organized as follows: Section 2 describes the sample, Section 3 examines the influence of leverage and financial distress on REIT returns surrounding the financial crisis, Section 4 examines the relationship between debt maturity, equity issues and property sales and Section 5 draws some conclusions.

2. Data and Summary Statistics

This section describes the sample and presents univariate summary statistics.

2.1 Sample

The primary source of our REIT data is SNL, which contains financial and property data on US REITs. We restrict the sample to those REITs listed on the stock market as of December 31, 2006 and to ensure that REITs are publicly traded, the SNL sample includes only firms with CRSP share codes of 18 or 48. Our total sample included 138 REITs.

Our explanatory variables are measured as of financial year-end 2006 and include firm size measured as the natural logarithm of total assets (*Size*), Q is the ratio of firm market value (market capitalization plus total assets less book value of equity) to total assets, *Cash/Total Assets*, the ratio of cash and cash equivalents to total assets, and *FFO per share*, funds from operations per share. As proxies for leverage, we use *Market Leverage*, the ratio of total debt (defined as the book value of short-term and long-term interest bearing debt, where short-term

⁴ A recent empirical study by Almeida, Campello, Laranjeira and Weisbenner (2012) examined the effect of maturity structure on investment during the financial crisis. They found that firms whose debt was largely maturing right after the third quarter of 2007 reduced investment by 2.5% more per quarter than otherwise similar firms whose debt was scheduled to mature well after 2008.

debt is defined as debt due in one year) to market value of the firm (defined as total debt plus book value of preferred stock plus market capitalization), and *Preferred Stock*, the ratio of the book value of preferred stock to total capital. As proxies for the maturity structure of the debt, we use *Variable Rate Debt/Total Debt* is the ratio of variable interest rate debt to total debt, *Debt Due Next Year/Total Debt* is the ratio of debt due next year to total debt, and *Debt Due in 2nd or 3rd Year/Total Debt* is the ratio of debt due in two or three years to total debt. In addition, we include indicator variables set equal to one when a REIT is classified as a property type: Health Care, Hotel, Residential, Office & Industrial, Retail, Specialty, or Diversified as of financial year-end 2006.

The dependent variables used in the analysis below are the cumulative monthly rates of return, equity issues and property sales for each REIT. Monthly rates of return for each REIT over the full sample period January 2007 to December 2011 are obtained from CRSP. We estimate the cumulative monthly rates of return for the time periods January 2007 to February 2009 (*Cumulative Return 2007-2009*), the time period March 2009 to December 2011 (*Cumulative Return 2009-2011*) and the full sample period January 2007 to December 2011 period (*Cumulative Return 2007-2011*). Equity issues for each REIT are estimated for 2009 as the sum of common stock and preferred stock issues over the market value of invested capital (book value of short-term debt plus book value of long-term interest bearing debt plus book value of preferred stock plus market capitalization) (*Stock Issues/Market Value of Invested Capital*). For each REIT, property sales for 2009 are estimated as property sales less acquisitions over total assets (*Net Property Sales/Total Assets*).

2.2 Summary Statistics

Table 1 presents summary statistics for the sample of 138 REITs. As of financial year-end 2006, the mean market leverage ratio for the sample is 38.20%. Preferred stock represent only 4.1% of total capital, defined as total debt plus book value of preferred stock plus market capitalization. Variable rate debt, Debt due next year and debt due in two and three years is on average 15.5%, 12.3% and 20.3% of total debt, respectively.

Over the initial period January 2007 to February 2009, the mean cumulative rate of return of our sample of listed REITs was -60.77% while the mean cumulative rate of return over the second period period March 2009 to December 2011 was 182.14%. It should also be noted that the cumulative returns in the second sub-period were substantially more dispersed than those in the initial period. Over the full sample period, January 2007 to December 2011, the mean cumulative rate of return of our sample of listed REITs was -6.46%. As a consequence of the existence of outliers in the distribution of cumulative returns, we winsorize the cumulative returns of the individual REITs at the 2% level in all three time periods.

In 2009 mean equity issues (defined as the total of common stock and preferred stock issues) were 13.39% of invested capital, while property sales only represented 0.21% of total assets.

[Table 1 about here]

It should be noted that our sample includes 22 REITs that delisted during our sample period either because of a merger, privatization or Chapter 11 bankruptcy. 17 REITs delisted as a consequence of a merger, 14 in 2007, 2 in 2008 and 1 in 2011. 2 REITs went private in 2008 and 1 in 2009. These REITs had similar leverage and debt maturity structures to the surviving REITs

in our sample. However, the two firms that filed for Chapter 11 had higher debt to asset ratios and more debt due in the current year and the next two or three years than the surviving REITs in our sample.

Table 2 summarizes our sample by property type, Health Care, Hotel, Residential, Office & Industrial, Retail, Specialty, and Diversified as at financial year-end 2006. We see from Table 2 that the sample is broadly distributed across the seven property types and that all property types realized a price decline between January 2007 and February 2009. However, REITs classified as Hotel, Office & Industrial, Retail and Diversified had not recovered their December 2006 levels by December 2011. While all property types raised equity capital in 2009, only the Hotel, Residential, Retail and Diversified sectors were net property sellers in 2009, with sales exceeding acquisitions.

[Table 2 about here]

Table 3 presents the Pearson correlation coefficients between cumulative returns and our proxies for leverage and debt maturity, together with indicator variables equal to one when a REIT is classified in a property type: Health Care, Hotel, Residential, Office & Industrial, Retail, Specialty, or Diversified as of financial year-end 2006.

[Table 3 about here]

The results, reported in Table 3, suggest that firm size, leverage, debt maturity and property type are associated with both the price decline and the subsequent rebound for REITs.

In particular,

- larger REITs experienced larger price declines and larger subsequent recoveries;
- high Q REITs experience smaller price declines and smaller subsequent recoveries;
- the more levered REIT's experienced larger declines in the downturn and then greater return in the recovery period; and
- the larger the price decline, the stronger the price rebound.

The association between property type and price decline/rebound is significant for all property types and differs across property types. Health Care and Residential REITs were associated with smaller price declines and subsequent rebounds.

Finally, leverage and debt maturity are associated with equity issues and property sales. Specifically, the more levered REITs and REITs with relatively more short-term debt raised proportionally more equity (both common and preferred stock) and were net sellers of property (i.e., sales exceeded acquisitions) in 2009.

To investigate whether these variables are likely to be subject to collinearity problems in our later regression analysis, we examine the correlations between the explanatory variables that are used in our analysis. From Table 3, we see that several variables are highly correlated with each other, in particular, our measures of debt maturity. This multi-collinearity makes it difficult to interpret the impact of some of the individual variables; hence we examine these variables in separate regressions to mitigate this problem.

3. Leverage, Debt Maturity and REIT Prices

This section examines the relation between leverage, debt maturity and property type; and the price collapse and subsequent rebound of REITs. Table 4 presents the results of the regression of firm characteristics, market leverage, debt maturity and property type as of financial year-end 2006 on cumulative monthly rates of returns for the sample of REITs. We report separate regressions for our different leverage and debt maturity measures to mitigate the impact of multicollinearity. Panel A of Table 4 reports the results for the time period, January 2007 to February 2009 and Panel B of Table 4 reports the regressions with the same independent variables, but with the returns used as the dependent variable calculated over the February 2009 to December 2011 time period. In addition, in Panel B we include the cumulative return over the time period January 2007 to February 2009, as an explanatory variable. Panel C of Table 4 we report the same regressions for the full sample period, January 2007 to December 2011. In all regressions we drop the Health Care property sector indicator variable and include a constant term.

[Table 4 about here]

3.1 An Analysis of the Collapse: January 2007 to February 2009

Panel A of Table 4 reports cross-sectional regressions of REIT returns in the crash period on our independent variables. In addition to the property type dummies, the regressions reveal that the size, leverage and maturity structure of the REITs significantly influence the magnitude of the REIT declines during this time period.

As one would expect, the more levered REITs experienced the largest price declines, however, the amount of preferred stock financing did not have a statistically significant effect,

perhaps, because the magnitude and cross-sectional variation in the use of preferred stock was not sufficiently large. We also see that REITs with relatively more short-term debt (i.e., more debt due in two or three years and more variable rate debt) fell significantly more during this time period. This later evidence suggests that a significant part of the decline was due to concerns about financial distress costs. However, the regressions suggest that the larger REITs suffered the largest declines. Since the larger REITs are likely to be less subject to rollover risk and probably have lower financial distress costs,⁵ this last finding is inconsistent with the idea that a large part of the decline is due to financial distress costs. This last observation is somewhat puzzling and will be discussed below.

The results with respect to the influence of property type on price declines reveal that all property groups experienced a price decline and that the extent of the decline varied significantly across groups. Further, the significant differences across property types persist even with the inclusion of our measures for leverage and financial distress.

3.2 Price Rebound: February 2009 to December 2011

Panel B of Table 4 reports cross-sectional regressions of REIT returns in the rebound period on our independent variables. The cross-sectional dispersion of returns in this second time period is extremely high, and as a result, the level of statistical significance is relatively low even though the magnitudes of many of the coefficients in these regressions are substantially larger than their counterparts in the regressions for the crash period. In any event, the regressions reveal that size, leverage and the maturity structure of the REITs influence the magnitude of the REIT returns during this time period. The results on leverage and maturity structure is consistent with the idea

⁵ While this is intuitive, there is evidence to suggest that with respect to rolling over syndicated loans, credit worthy firms tend to be more sensitive to credit market conditions (Mian and Santos, 2011).

that the prices of the weakly capitalized REITs overreacted to the threat of financial distress and thus rebounded when the threat was not realized (indeed, only two REITs went bankrupt).

The fact that the larger REITs experienced stronger returns in the rebound period is consistent with the idea that, at least with the benefit of hindsight, the large REITs may have overreacted to the negative events in the earlier period. One possibility is that the larger REITs were held more by institutions that were forced to liquidate their holdings in the crisis period. It should be noted that the returns of REITs in the earlier period are strongly negatively related to returns in the rebound period, which is consistent with unobserved characteristics that may have been associated with forced portfolio liquidations causing overreactions in the first subperiod. It is worth noting that the coefficients of the size and capital structure variables decline substantially when past returns are included in the regression.

The results with respect to the influence of property type on the price rebound are mixed. While all property types experience a price rebound, the difference between property types is weaker than that observed in the initial period.

3.3 Performance over the entire time period: January 2007 to December 2011

Panel C of Table 4 reports cross-sectional regressions of REIT returns over the entire period on our independent variables. This regression provides estimates of the effects of capital structure on prices over the entire cycle. Recall, as we showed in Figure 1, commercial real estate prices, as measured by the NCREIF index, had fully recovered by the end of 2011. Hence, the returns measured over this entire period provide estimates of the extent to which the turmoil experienced during the crisis period had a permanent effect on REIT equity values.

The most noteworthy result in this table is that the REITs with substantial amounts of debt that matured during the crisis period did significantly worse over the entire time period. There are a number of potential explanations. They may have been forced to sell properties or issue equity at unattractive prices, they may have lost key personnel, or they may have been forced to divert their attentions to dealing with a financial crunch, leaving less time to spend on their core business. It is also noteworthy that there was no size effect over the entire period, suggesting that the decline of the large REITs in the crash period may not have been due to fundamentals. Finally, it should be noted that the REITs that had the most cash, and which were generating the most cash (those with higher FFO), realized higher stock returns over the entire cycle.⁶

3.4 Prior Two Year Windows

We now turn to the examination of the robustness of our results to both model specification and sample period. Specifically, for two-year non-overlapping sample periods from 1993 to 2006, we replicate our cross-sectional regressions of cumulative monthly REIT returns on firm characteristics, market leverage, debt maturity and property type as of financial year-end prior to the commencement of the respective sample period. The purpose of this exercise is to determine

⁶ In unreported regressions, we replace market leverage with book leverage, defined as the ratio of total debt to total capital (total debt plus book value of preferred stock plus book value of common stock). Consistent with the results we report for market leverage (Table 4) we find that the stock price of REITs with higher book leverage ratios and shorter debt maturity fell more during the initial time period. However, while the debt maturity effects persist over the full sample period, we find no support for any persistence in the leverage effect. We also examined the robustness of our result with respect to the influence of property type. Adjusted returns are calculated by demeaning cumulative returns by property type mean returns and property type indicator variables are dropped from the regressions for the three time periods. The results with respect to leverage, debt due in two or three years and variable rate debt are robust to this change, however debt maturity (short-term debt to long-term debt ratio) is no longer significant in either the initial time period or the whole sample period. In addition, we examined the robustness of our results with respect to the level of active institutional ownership. We find that institutional activism is only weakly associated with price behavior during the financial crisis and that our results were robust to its inclusion. Finally, we examined the robustness of our results to the existence of a line of credit. In particular, we included the available balance and found that this variable was only weakly associated with price behavior during the financial crisis and that our results were robust to its inclusion.

whether the strong cross-sectional relation between debt maturity structure and returns only occurs during periods of financial turmoil, as we expect, or whether this is a statistical artifact that appears in other years as well.

It should be noted that the mean cumulative rate of return of our sample of listed REITs was positive in each of the two-year sample periods, suggesting the leverage should have a positive effect on returns in each of the two-year regressions. We do, in fact, find a positive relation between leverage and returns in three periods, but the effect is weak. However, it is noteworthy that we find no significant association between debt maturity and returns in any of these two year periods.

4. Debt Maturity, Equity Issues and Property Sales

Because of their financial distress, a number of REITs were forced to sell assets and issue equity during the crisis period when commercial real estate and REIT prices were depressed. In this section we explicitly examine the extent to which their capital structures influenced these choices. In particular, we examine the relationship between the proportion of the REIT's total debt due in two or three years from 2006 and the level of equity issues and property sales in 2009.

Table 5 presents the results of the regression of firm characteristics (including market leverage), debt maturity and property type as of financial year-end 2006 on equity issues and net property sales in 2009 for the sample of REITs. In all regressions we drop the Health Care property sector indicator variable and include a constant term.

[Table 5 about here]

These regressions indicate that the proportion of debt due in the short-term has a significant influence on the financing and investment decision of REIT following the price decline in 2007 and 2008. Specifically, we find that in 2009 REITs with relatively more short-term debt in 2006 (i.e., more debt due in two or three years and more variable rate debt) raised proportionally more equity (both common and preferred stock) and were net sellers of property (i.e., sales exceeded acquisitions). The fact that they issued shares and sold assets at what, ex post, can be viewed as unattractive prices provides a plausible explanation for why these REITs performed poorly over the entire cycle.

5. Conclusion

It is clear that financial leverage played a large roll in the substantial decline in REIT prices during the financial crisis. Our regressions, which use debt maturity structure to distinguish between the pure amplification effect of leverage and the effect of financial distress, indicate that a significant part of the decline in REIT prices was due to anticipated costs associated with financial distress. Specifically we find that the share prices of REITs with higher debt to asset ratios fell more during the initial time period, which is consistent with the pure leverage effect, and that the decline was greater for REITs with shorter maturity debt (debt due in two or three years and variable interest rate debt), which is consistent with financial distress costs. Further, REITs with shorter maturity debt raised relatively more equity capital and sold more properties (sales exceeded acquisitions). Finally, we find that these effects persist over the full sample period, January 2007 to December 2011, suggesting that some of the anticipated financial distress costs were realized even though very few REITs actually went bankrupt.

Although we are looking at an extreme event, to some extent our results underestimate the potential effects of financial leverage. The first thing to note is our regressions ignore the endogeneity of REIT capital structure choices. Specifically, there is likely to be a tendency of the REITs that are best positioned to cope with the effect of financial leverage to have the highest debt ratios with the shortest maturities.⁷ Moreover, legislation that allowed REITs to substitute stock dividends for cash dividends allowed those that were the most exposed to financial distress costs to conserve their cash, allowing them to mitigate the costs of financial distress.⁸ If REITs had been forced to maintain their payouts, the effect of the financial crisis would surely have been worse.

⁷ There is a large literature that examines how REIT financing choices are influenced by their characteristics (Casey, Sumner and James, 2006; Ertugrul and Giambona; 2011; Harrison, Panasian and Seiler. 2011; Morri and Beretta, 2008). There is also evidence that having a strong banking relationship influences capital structure choices as well as the ability of REITs to deal with financial downturns. For example, Hardin and Wu (2010) find that REITs with banking relationships are more likely to use more long-term debt, less secured debt and have lower leverage. In addition, Hardin and Hill (2011) consider the utilization of credit lines and Ooi, Wong and Ong (2012) find that during the financial crisis bank lines of credit insulated REITs from the impact of tightening credit conditions.

⁸ See Case, Hardin and Wu (2012) for a discussion REIT dividend policies and dividend announcement effects during this time period. They find that during the financial crisis REITs with higher market leverage were more likely to cut dividends, suspend dividends or pay stock dividends in lieu of cash dividends.

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Figure 1
Cumulative Return of NAREIT and NCREIF Indices

This figure plots the cumulative returns of both the NAREIT All Equity REITs Index (levered and unlevered) and the NCREIF Property Index over the period January 2000 to December 2011.

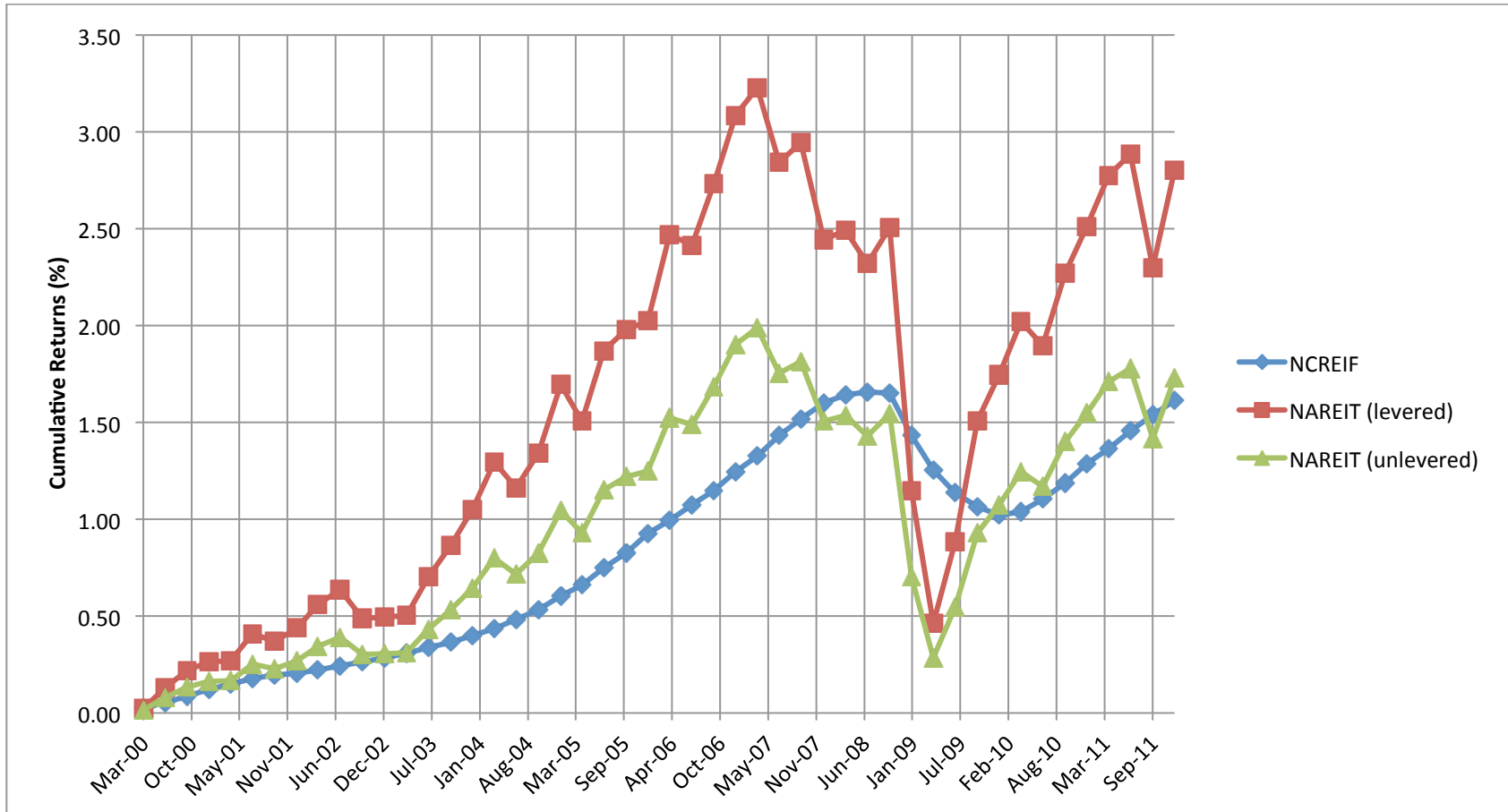


Figure 2
Cumulative Return of REIT by Property Type

This figure plots the cumulative return of a sample of REITs classified by property type: (i) health care; (ii) hotel; (iii) residential; (iv) office and industrial; (v) shopping centers, regional malls and retail; (vi) speciality; and (vii) diversified.

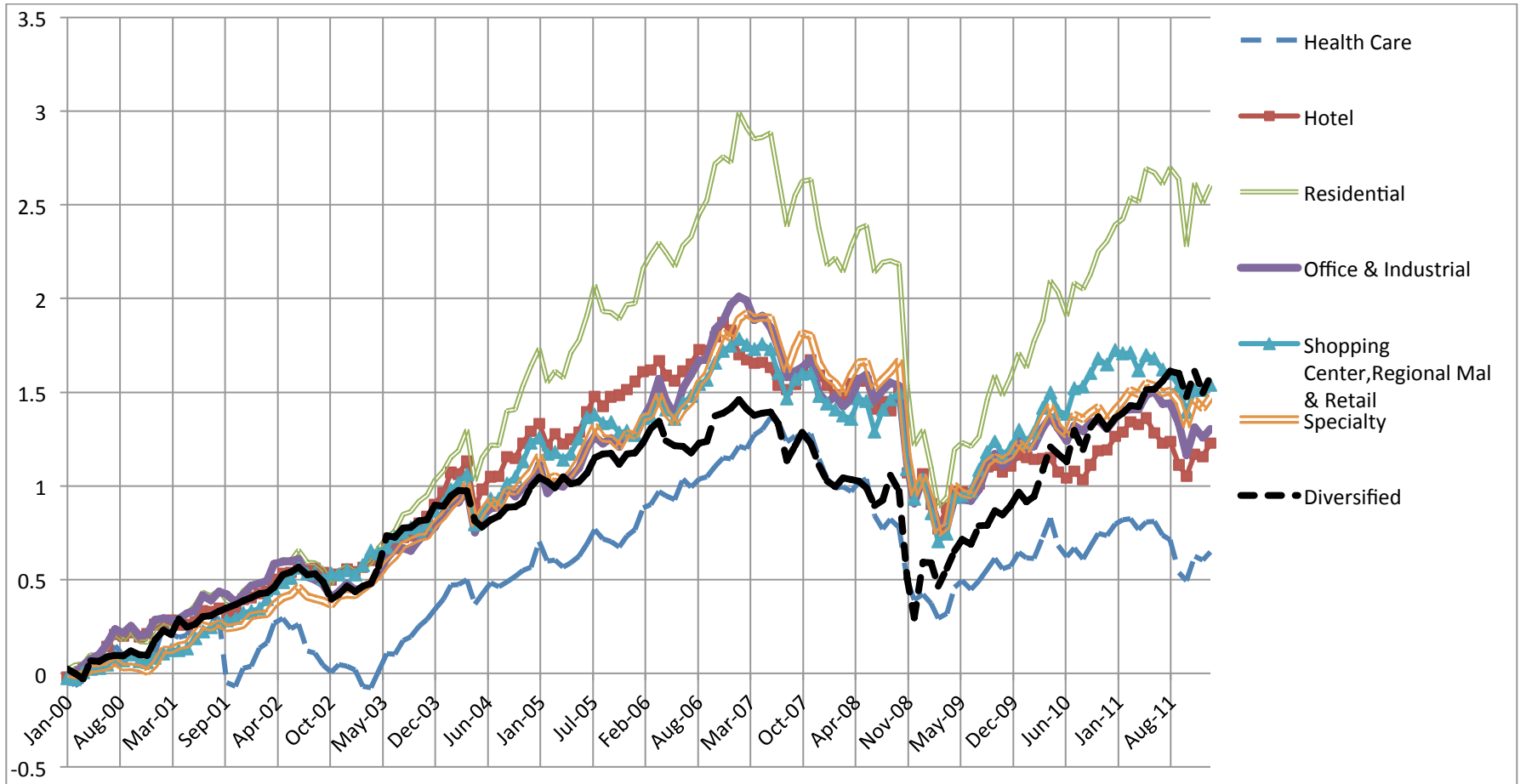


Figure 3
Beta of NAREIT Index

This figure plots the beta of monthly rates of returns on the NAREIT All Equity REITs Index against the S&P500 Index over the period January 2000 to December 2011. Betas are estimated using a rolling 36-month window

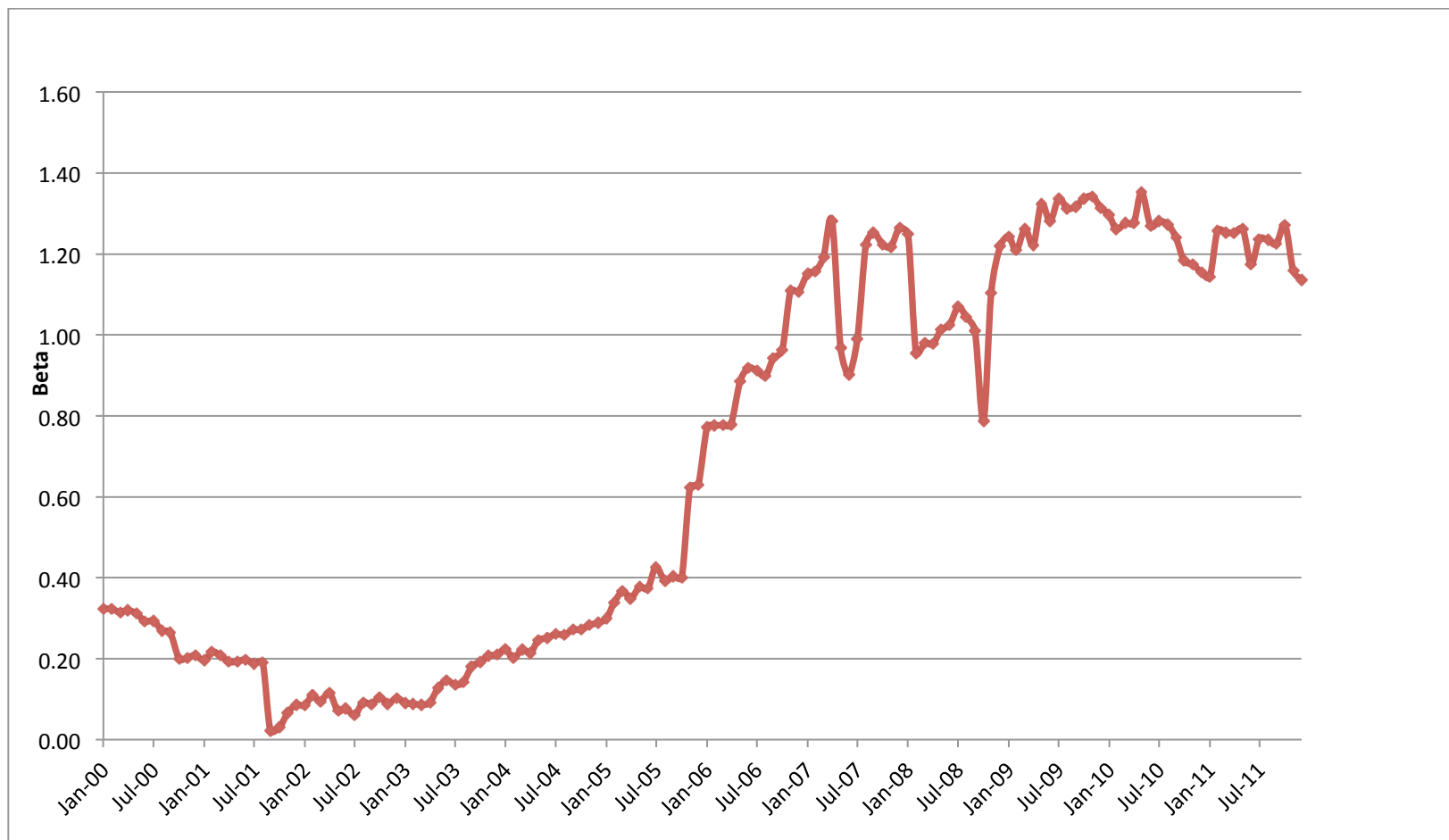


Table 1
Summary Statistics

The table provides the mean, standard deviation, 5th, 25th, 75th and 95th percentiles and median of each variable. *Cumulative Return 2007-2011* is the cumulative monthly rates of return for the time period January 2007 to December 2011 period. *Cumulative Return 2007-2009* is the cumulative monthly rates of return for the time period January 2007 to February 2009. *Cumulative Return 2009-2011* is the cumulative monthly rates of return for the time period March 2009 to December 2011 period. *Stock Issues/Market Value of Invested Capital* is the ratio of the sum of common stock and preferred stock issues to the market value of invested capital (book value of short-term debt plus book value of long-term interest bearing debt plus book value of preferred stock plus market capitalization). *Net Property Sales/Total Assets* is the ratio of property sales less acquisitions to total assets. Firm size is measured as the natural logarithm of total assets (*Size*). *Q* is the ratio of firm market value (market capitalization plus total assets less book value of equity) to total assets. *Cash/Total Assets* is the ratio of cash and cash equivalents to total assets. *FFO per share* is funds from operations per share. *Market Leverage* is the ratio of total debt (book value of short-term and long-term interest bearing debt) to market value of invested capital (total debt plus book value of preferred stock plus market capitalization). *Preferred Stock* is the ratio of the book value of preferred stock to total capital. *Variable Rate Debt/Total Debt* is the ratio of variable interest rate debt to total debt. *Debt Due Next Year/Total Debt* is the ratio of debt due next year to total debt. *Debt Due in 2nd or 3rd Year/Total Debt* is the ratio of debt due in two years to total debt. With the exception of the cumulative returns measures all variables are measured as at financial year-end 2006

Variable	N	Mean	Std Dev	5th Pctl	25th Pctl	50th Pctl	75th Pctl	95th Pctl
Cumulative Return 2007-2011	111	-0.0646	0.4952	-0.7497	-0.4154	-0.1466	0.2823	0.8680
Cumulative Return 2007-2009	114	-0.6077	0.2373	-0.9436	-0.7994	-0.6404	-0.4765	-0.1311
Cumulative Return 2009-2011	111	1.8214	1.5251	-0.0014	0.7940	1.3596	2.4810	5.3806
Stock Issues/Market Value of Invested Capital	114	0.1339	0.1811	0.0000	0.0011	0.0921	0.1851	0.4615
Net Property Sales/Total Assets	107	0.0021	0.0501	-0.0666	0.0000	0.0010	0.0181	0.0664
Total Assets	138	3,302,062	4,497,246	115,740	851,692	1,741,625	3,957,463	13,300,000
Size	138	14.2416	1.4521	11.6591	13.6550	14.3703	15.1911	16.4002
Q	136	1.5553	0.4382	1.0961	1.2464	1.4877	1.6998	2.2382
Cash/Total Assets	138	0.0293	0.0510	0.0007	0.0043	0.0107	0.0365	0.1244
FFO per share	120	0.4333	1.3585	0.0800	0.2900	0.4850	0.8100	1.2200
Market Leverage	136	0.3820	0.1611	0.0542	0.2784	0.3877	0.4912	0.6318
Preferred Stock	136	0.0363	0.0518	0.0000	0.0000	0.0160	0.0551	0.1386
Variable Rate Debt/Total Debt	134	0.1552	0.1603	0.0000	0.0542	0.1168	0.2235	0.4216
Debt Due Next Year/Total Debt	127	0.1230	0.1670	0.0046	0.0296	0.0792	0.1433	0.3948
Debt Due in 2 nd or 3 rd Year/Total Debt	127	0.2036	0.1508	0.0208	0.0911	0.1747	0.2801	0.5180

Table 2
REITs by Property Type

Table 2 provides a breakdown of our sample listed REITs by property type as at financial year-end 2006. This table provides the number of REITs, cumulative rates of return, stock issues and net property sales for each property group. All variables are as defined in Table 1.

Property type	N	Mean Cumulative Return 2007-2011	Mean Cumulative Return 2007-2009	Mean Cumulative Return 2009-2011	Stock Issues/Market Value of Invested Capital	Net Property Sales/Total Assets
Health Care	13	0.3363	-0.3506	1.1573	0.0967	-0.0355
Hotel	16	-0.3877	-0.7878	2.8021	0.1803	0.0064
Residential	17	0.2290	-0.6328	2.6897	0.0832	0.0196
Office & Industrial	24	-0.3339	-0.6466	1.1780	0.1251	-0.0023
Retail (Shopping Center, Regional Mall & Retail)	28	-0.1276	-0.6478	2.0871	0.1534	0.0019
Specialty	10	0.4022	-0.4676	1.9128	0.2042	-0.0027
Diversified	12	-0.2368	-0.5835	0.9772	0.1023	0.0200

Table 3
Correlation Matrix

The table provides correlation matrix for our sample. Pearson correlation coefficients for all independent variables, cumulative returns stock issues and net property sales, together with each pairing of independent variables are presented. Variables are as defined in Tables 1. Cumulative returns are winsorized at the 2 % level. In addition, we include indicator variable equal to one when a REIT is classified in a property type: Health Care, Hotel, Residential, Office & Industrial, Retail, Specialty, or Diversified as at financial year-end 2006. P-values are in italics.

Variables	Cumulative Return 2007-2011	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Cumulative Return 2007-2009	[1] 0.733 <i>0.00</i>										
Cumulative Return 2009-2011	[2] 0.056 <i>0.56</i>	-0.508 <i>0.00</i>									
Stock Issues/Market Value of Invested Capital	[3] -0.349 <i>0.00</i>	-0.371 <i>0.00</i>	0.214 <i>0.03</i>								
Net Property Sales/Total Assets	[4] -0.176 <i>0.07</i>	-0.416 <i>0.00</i>	0.287 <i>0.00</i>	0.105 <i>0.28</i>							
Size	[5] -0.016 <i>0.86</i>	-0.255 <i>0.01</i>	0.311 <i>0.00</i>	0.147 <i>0.11</i>	0.262 <i>0.00</i>						
Q	[6] 0.094 <i>0.33</i>	0.235 <i>0.01</i>	-0.186 <i>0.05</i>	-0.177 <i>0.06</i>	-0.36 <i>0.00</i>	-0.056 <i>0.52</i>					
Cash/Total Assets	[7] 0.060 <i>0.53</i>	0.047 <i>0.62</i>	-0.033 <i>0.73</i>	-0.139 <i>0.14</i>	-0.208 <i>0.03</i>	-0.159 <i>0.06</i>	0.198 <i>0.02</i>				
FFO per share	[8] -0.015 <i>0.89</i>	-0.001 <i>0.99</i>	-0.023 <i>0.82</i>	0.083 <i>0.40</i>	0.007 <i>0.94</i>	0.144 <i>0.12</i>	-0.138 <i>0.13</i>	-0.649 <i>0.00</i>			
Market Leverage	[9] -0.191 <i>0.05</i>	-0.397 <i>0.00</i>	0.275 <i>0.00</i>	0.192 <i>0.04</i>	0.370 <i>0.00</i>	0.084 <i>0.33</i>	-0.655 <i>0.00</i>	-0.145 <i>0.09</i>	-0.062 <i>0.50</i>		
Preferred Stock	[10] -0.024 <i>0.80</i>	-0.007 <i>0.94</i>	0.077 <i>0.42</i>	-0.029 <i>0.75</i>	0.020 <i>0.83</i>	0.061 <i>0.48</i>	-0.082 <i>0.34</i>	-0.062 <i>0.47</i>	0.075 <i>0.42</i>	-0.209 <i>0.01</i>	
Variable Rate Debt/Total Debt	[11] -0.239 <i>0.01</i>	-0.141 <i>0.14</i>	-0.044 <i>0.66</i>	0.163 <i>0.08</i>	-0.001 <i>0.98</i>	-0.186 <i>0.03</i>	0.075 <i>0.39</i>	-0.067 <i>0.44</i>	0.071 <i>0.44</i>	-0.086 <i>0.33</i>	-0.087 <i>0.32</i>
Debt Due Next Year/Total Debt	[12] -0.062 <i>0.54</i>	0.093 <i>0.35</i>	-0.130 <i>0.19</i>	0.022 <i>0.82</i>	-0.236 <i>0.01</i>	-0.291 <i>0.00</i>	0.143 <i>0.11</i>	-0.006 <i>0.95</i>	0.042 <i>0.66</i>	-0.173 <i>0.05</i>	0.005 <i>0.96</i>

Table 3 (continued)

Variables	Cumulative Return 2007-2011	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	
Debt Due in 2 nd or 3 rd Year/Total Debt	[13]	-0.139 <i>0.17</i>	-0.162 <i>0.10</i>	0.090 <i>0.37</i>	0.371 <i>0.00</i>	0.231 <i>0.02</i>	0.072 <i>0.42</i>	0.070 <i>0.44</i>	-0.205 <i>0.02</i>	0.068 <i>0.48</i>	-0.116 <i>0.20</i>	0.017 <i>0.85</i>
Health Care	[14]	0.270 <i>0.00</i>	0.373 <i>0.00</i>	-0.145 <i>0.13</i>	-0.070 <i>0.45</i>	-0.242 <i>0.01</i>	-0.075 <i>0.39</i>	0.090 <i>0.30</i>	0.025 <i>0.77</i>	0.017 <i>0.85</i>	-0.208 <i>0.02</i>	-0.024 <i>0.78</i>
Hotel	[15]	-0.228 <i>0.02</i>	-0.262 <i>0.00</i>	0.219 <i>0.02</i>	0.084 <i>0.37</i>	0.029 <i>0.76</i>	-0.095 <i>0.27</i>	-0.213 <i>0.01</i>	-0.019 <i>0.82</i>	-0.024 <i>0.79</i>	0.081 <i>0.35</i>	0.233 <i>0.01</i>
Residential	[16]	0.235 <i>0.01</i>	-0.041 <i>0.66</i>	0.226 <i>0.02</i>	-0.105 <i>0.26</i>	0.141 <i>0.14</i>	0.108 <i>0.21</i>	0.018 <i>0.83</i>	-0.141 <i>0.10</i>	0.058 <i>0.53</i>	0.130 <i>0.13</i>	-0.088 <i>0.31</i>
Office & Industrial	[17]	-0.265 <i>0.01</i>	-0.080 <i>0.39</i>	-0.199 <i>0.04</i>	-0.024 <i>0.79</i>	-0.046 <i>0.63</i>	0.121 <i>0.16</i>	-0.002 <i>0.98</i>	-0.064 <i>0.46</i>	0.066 <i>0.48</i>	0.043 <i>0.62</i>	-0.083 <i>0.34</i>
Retail	[18]	-0.073 <i>0.45</i>	-0.094 <i>0.32</i>	0.085 <i>0.37</i>	0.061 <i>0.51</i>	-0.002 <i>0.97</i>	0.028 <i>0.74</i>	0.127 <i>0.14</i>	0.050 <i>0.56</i>	-0.159 <i>0.08</i>	0.012 <i>0.89</i>	-0.075 <i>0.39</i>
Specialty	[19]	0.292 <i>0.00</i>	0.194 <i>0.04</i>	0.020 <i>0.84</i>	0.127 <i>0.17</i>	-0.027 <i>0.77</i>	0.046 <i>0.59</i>	0.074 <i>0.39</i>	0.011 <i>0.89</i>	0.022 <i>0.82</i>	-0.113 <i>0.19</i>	-0.101 <i>0.24</i>
Diversified	[20]	-0.127 <i>0.18</i>	-0.016 <i>0.87</i>	-0.203 <i>0.03</i>	-0.068 <i>0.47</i>	0.127 <i>0.19</i>	-0.182 <i>0.03</i>	-0.115 <i>0.18</i>	0.149 <i>0.08</i>	0.059 <i>0.52</i>	0.012 <i>0.89</i>	0.172 <i>0.05</i>

Table 3 (continued)

		[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
Debt Due Next Year/Total Debt	[12]	0.362								
		<i>0.00</i>								
Debt Due in 2 nd or 3 rd Year/Total Debt	[13]	0.213	-0.169							
		<i>0.02</i>	<i>0.06</i>							
Health Care	[14]	0.271	0.082	0.061						
		<i>0.00</i>	<i>0.36</i>	<i>0.50</i>						
Hotel	[15]	-0.037	-0.027	0.050	-0.121					
		<i>0.68</i>	<i>0.76</i>	<i>0.58</i>	<i>0.16</i>					
Residential	[16]	-0.043	-0.097	-0.021	-0.125	-0.145				
		<i>0.62</i>	<i>0.28</i>	<i>0.81</i>	<i>0.14</i>	<i>0.09</i>				
Office & Industrial	[17]	-0.085	-0.021	0.003	-0.163	-0.189	-0.195			
		<i>0.33</i>	<i>0.82</i>	<i>0.97</i>	<i>0.06</i>	<i>0.03</i>	<i>0.02</i>			
Retail	[18]	-0.025	0.221	-0.099	-0.174	-0.202	-0.209	-0.272		
		<i>0.78</i>	<i>0.01</i>	<i>0.27</i>	<i>0.04</i>	<i>0.02</i>	<i>0.01</i>	<i>0.00</i>		
Specialty	[19]	0.010	-0.121	0.131	-0.113	-0.131	-0.135	-0.176	-0.188	
		<i>0.91</i>	<i>0.17</i>	<i>0.14</i>	<i>0.19</i>	<i>0.13</i>	<i>0.11</i>	<i>0.04</i>	<i>0.03</i>	
Diversified	[20]	-0.040	-0.095	-0.090	-0.117	-0.136	-0.140	-0.183	-0.195	-0.127
		<i>0.64</i>	<i>0.29</i>	<i>0.32</i>	<i>0.17</i>	<i>0.11</i>	<i>0.10</i>	<i>0.03</i>	<i>0.02</i>	<i>0.14</i>

Table 4
REIT Characteristics and Cumulative Returns

This table presents regressions of cumulative returns on REIT characteristics as defined in Table 1. The full sample period (Panel C) is divided into two sub-samples January 2007 to February 2009 (Panel A) and March 2009 to December 2011 (Panel B). Cumulative returns are winsorized at the 2 % level. This table also reports the adjusted R-squared and number of observations. Standard errors are White. T-statistics are given in parentheses. *, **, and ***, significant at the 10, 5 and 1 percent level, respectively. F-test is for the hypothesis that the coefficients on all property type indicator variables are equal.

Panel A: January 2007 to February 2009

Dependent variable: <i>Cumulative Return 2009-2011</i>						
Independent variables	[1]	[2]	[3]	[4]	[5]	[6]
Size		-0.048 (3.35)***	-0.049 (3.38)***	-0.049 (3.57)***	-0.043 (3.42)***	-0.041 (3.20)***
Q		0.025 (0.34)	0.029 (0.36)	0.039 (0.51)	0.001 (0.02)	-0.018 (0.22)
FFO per share		0.01 (0.96)	0.011 (0.98)	0.007 (0.66)	-0.002 (0.22)	-0.004 (0.36)
Cash/Total Assets		0.293 (0.91)	0.304 (0.94)	0.004 (0.01)	-0.204 (0.59)	-0.326 (0.95)
Market Leverage		-0.371 (1.84)*	-0.359 (1.70)*	-0.33 (1.61)	-0.451 (2.04)**	-0.507 (2.17)**
Preferred Stock			0.06 (0.19)			-0.408 (1.36)
Variable Rate Debt/Total Debt				-0.528 (4.07)***		-0.362 (2.07)**
Debt Due Next Year/Total Debt					0.057 (0.47)	0.056 (0.47)
Debt Due in 2 nd or 3 rd Year/Total Debt					-0.423 (3.82)***	-0.31 (2.43)**
Hotel	-0.437 (4.90)***	-0.443 (6.68)***	-0.444 (6.70)***	-0.497 (7.59)***	-0.495 (8.54)***	-0.519 (9.34)***
Residential	-0.282 (4.07)***	-0.197 (2.78)***	-0.198 (2.78)***	-0.26 (3.73)***	-0.248 (3.65)***	-0.279 (4.24)***
Office & Industrial	-0.296 (4.14)***	-0.228 (3.20)***	-0.229 (3.20)***	-0.273 (3.89)***	-0.286 (4.23)***	-0.309 (4.67)***
Retail	-0.296 (4.02)***	-0.233 (3.29)***	-0.234 (3.30)***	-0.303 (4.45)***	-0.296 (4.36)***	-0.326 (5.10)***
Specialty	-0.117 (1.26)	-0.143 (1.37)	-0.143 (1.37)	-0.211 (2.03)**	-0.153 (1.49)	-0.198 (1.81)*
Diversified	-0.267 (2.89)***	-0.208 (2.36)**	-0.21 (2.32)**	-0.248 (3.39)***	-0.258 (3.03)***	-0.259 (3.36)***
Constant	-0.351 (5.87)***	0.385 (1.57)	0.376 (1.45)	0.501 (2.02)**	0.529 (2.16)**	0.623 (2.33)**
Observations	114	102	102	101	96	96
R-squared	0.23	0.43	0.43	0.50	0.53	0.56
F-test	2.22**	8.40***	8.19***	7.37***	10.13***	9.26***

Table 4 (continued)

Panel B: March 2009 to December 2011

Dependent variable: <i>Cumulative Return 2009-2011</i>							
Independent variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Size		0.362 (3.22)***	0.347 (3.14)***	0.362 (3.18)***	0.406 (2.85)***	0.379 (2.66)***	0.238 (1.64)
Q		-0.377 (0.72)	-0.137 (0.23)	-0.411 (0.75)	-0.113 (0.21)	0.295 (0.44)	0.247 (0.41)
FFO per share		0.003 (0.03)	0.025 (0.27)	0.007 (0.07)	0.077 (0.75)	0.117 (1.21)	0.108 (1.17)
Cash/Total Assets		1.575 (0.56)	2.273 (0.87)	1.973 (0.71)	3.698 (1.19)	4.855 (1.72)*	3.85 (1.54)
Market Leverage		1.782 (1.52)	2.521 (1.78)*	1.668 (1.24)	2.187 (1.63)	3.485 (1.98)*	1.762 (1.08)
Preferred Stock			3.758 (1.42)			5.233 (1.70)*	3.804 (1.42)
Variable Rate Debt/Total Debt				0.653 (0.76)		-0.176 (0.15)	-1.141 (0.99)
Debt Due Next Year/Total Debt					-0.544 (0.68)	-0.592 (0.70)	-0.372 (0.45)
Debt Due in 2 nd or 3 rd Year/Total Debt					1.515 (1.85)*	1.81 (1.90)*	0.756 (0.85)
Cumulative Return 2007-2009							-3.52 (3.62)***
Hotel	1.619 (2.76)***	1.346 (2.28)**	1.281 (2.19)**	1.424 (2.27)**	1.631 (2.96)***	1.559 (2.61)**	-0.236 (0.27)
Residential	1.532 (3.88)***	1.046 (2.41)**	1.012 (2.27)**	1.144 (2.65)***	1.233 (3.16)***	1.178 (2.99)***	0.223 (0.45)
Office & Industrial	0.056 (0.16)	-0.337 (0.78)	-0.347 (0.79)	-0.259 (0.56)	-0.199 (0.46)	-0.218 (0.50)	-1.28 (2.84)***
Retail	0.892 (2.01)**	0.627 (1.32)	0.584 (1.21)	0.73 (1.52)	0.997 (2.10)**	0.947 (2.06)**	-0.163 (0.33)
Specialty	0.756 (2.06)**	0.788 (1.99)**	0.776 (1.87)*	0.885 (2.17)**	0.785 (2.25)**	0.734 (1.89)*	0.066 (0.13)
Diversified	-0.18 (0.59)	-0.566 (1.49)	-0.718 (1.93)*	-0.502 (1.30)	-0.308 (0.81)	-0.517 (1.38)	-1.401 (2.80)***
Constant	1.157 (4.98)***	-3.861 (1.91)*	-4.435 (2.01)**	-3.964 (1.82)*	-5.658 (2.07)**	-6.633 (2.21)**	-4.595 (1.64)
Observations	111	100	100	99	94	94	94
R-squared	0.18	0.30	0.31	0.29	0.32	0.34	0.46
F-test	6.20***	6.14***	7.47***	5.78***	4.60***	4.84***	6.01***

Table 4 (continued)

Panel C: January 2007 to December 2011

Dependent variable: <i>Cumulative Return 2007-2011</i>						
Independent variables	[1]	[2]	[3]	[4]	[5]	[6]
Size		-0.012 (0.30)	-0.014 (0.36)	-0.015 (0.41)	-0.002 (0.04)	0 (0.01)
Q		0.055 (0.30)	0.095 (0.49)	0.044 (0.24)	0.041 (0.22)	0.058 (0.30)
FFO per share		0.045 (1.71)*	0.049 (1.79)*	0.034 (1.35)	0.029 (0.95)	0.031 (0.99)
Cash/Total Assets		1.973 (2.76)***	2.088 (2.81)***	1.291 (2.02)**	1.122 (1.30)	0.973 (1.14)
Market Leverage		-0.282 (0.61)	-0.159 (0.32)	-0.335 (0.74)	-0.549 (1.11)	-0.478 (0.91)
Preferred Stock			0.622 (0.87)			-0.256 (0.37)
Variable Rate Debt/Total Debt				-0.847 (4.49)***		-0.521 (3.16)***
Debt Due Next Year/Total Debt					-0.243 (0.72)	-0.255 (0.81)
Debt Due in 2 nd or 3 rd Year/Total Deb					-0.742 (2.68)***	-0.371 (1.24)
Hotel	-0.724 (3.74)***	-0.787 (4.99)***	-0.797 (5.04)***	-0.919 (6.79)***	-0.819 (4.83)***	-0.905 (6.37)***
Residential	-0.107 (0.66)	-0.026 (0.15)	-0.032 (0.19)	-0.163 (1.07)	-0.066 (0.37)	-0.171 (1.08)
Office & Industrial	-0.664 (4.16)***	-0.591 (3.68)***	-0.592 (3.74)***	-0.676 (4.67)***	-0.64 (3.75)***	-0.716 (4.73)***
Retail	-0.464 (2.77)***	-0.405 (2.37)**	-0.412 (2.43)**	-0.565 (3.97)***	-0.438 (2.39)**	-0.536 (3.48)***
Specialty	0.033 (0.17)	0.042 (0.20)	0.04 (0.19)	-0.122 (0.62)	0.008 (0.03)	-0.135 (0.61)
Diversified	-0.573 (3.18)***	-0.584 (3.36)***	-0.609 (3.50)***	-0.676 (5.13)***	-0.617 (3.53)***	-0.665 (4.65)***
Constant	0.336 (2.39)**	0.411 (0.63)	0.316 (0.49)	0.814 (1.32)	0.637 (0.86)	0.711 (1.00)
Observations	111	100	100	99	94	94
R-squared	0.31	0.4	0.41	0.49	0.48	0.52
F-test	8.46***	9.63***	9.58***	9.31***	9.55***	8.41***

Table 5
Debt Maturity, Equity Issues and Property Sales

This table presents regressions of equity issues and net property sales on REIT characteristics. The dependent variables are *Stock Issues/Market Value of Invested Capital* and *Net Property Sales/Total Assets*, estimated for 2009. All other variables are as defined in Table 1. This table also reports the adjusted R-squared and number of observations. Standard errors are White. T-statistics are given in parentheses. *, **, and ***, significant at the 10, 5 and 1 percent level, respectively.

Dependent variable:	<i>Stock Issues/Market Value of Invested Capital</i>	<i>Net Property Sales/Total Assets</i>
Independent variables:		
Size	0.0077 (0.44)	0.0113 (2.34)**
Q	-0.0092 (-0.17)	0.0008 (0.04)
FFO per share	0.0175 (1.43)	-0.0035 (-0.60)
Cash/Total Assets	0.2181 (0.74)	-0.0985 (-0.50)
Market Leverage	0.3530 (1.73)*	0.0730 (1.49)
Debt Due in 2 nd or 3 rd Year/Total Debt	0.4629 (3.54)***	0.0864 (2.77)***
Hotel	0.0823 (0.90)	0.0407 (1.47)
Residential	-0.0429 (-0.77)	0.0439 (1.73)*
Office & Industrial	0.0171 (0.33)	0.0357 (1.39)
Retail	0.0789 (1.22)	0.0405 (1.60)
Specialty	0.1871 (2.40)**	0.0267 (0.96)
Diversified	0.0387 (0.72)	0.0438 (1.69)*
Constant	-0.2404 (-0.70)	-0.2393 (-2.64)***
Observations	94	91
R-squared	0.29	0.31