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**Firm Level Factors that Affect Returns to Real
Estate Investment Trusts**

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Thesis, 2000

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**FIRM LEVEL FACTORS THAT AFFECT RETURNS TO
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Abstract:

This thesis examines the historical financial data for publicly traded securities issued by Real Estate Investment Trusts (REITS). The inquiry isolates certain quantifiable firm specific financial data and organizes that data into pooled, time-series cross-sections. Annual returns to capital are determined for certain equity REITS from 1990 to 1999 and are used as the dependent variable in a statistical regression analysis. The analysis includes independent variables drawn from a database and includes variables to adjust results for the impact of macroeconomic factors. In addition, indexes for the broader markets are identified and included in the regressions to adjust for the impact of trends in the general market.

Following adjustments for macroeconomic factors and general market trends the regression results identify various firm specific variables that display a statistically significant relationship to relative returns to capital in REIT securities over time. Negative impacts on returns are observed for increases in firm size and for certain debt features such as variable rate debt, unsecured debt, and total debt. Positive impacts on returns are associated with higher levels of asset growth as well as relatively higher levels of secured debt and preferred stock. The expected positive correlation of returns with increases in broader stock market indexes and negative correlation with increasing short-term interest rates is not displayed. For the period from 1993 to 1999, the data indicate an inverse correlation of REIT returns to the stock market as represented by the S&P 500 index and a direct relation with short-term interest rates.

Interpretations of the results are provided in a form that relates the firm level determinates of returns to capital with the history of REITS and their organizational and tax characteristics. Alternatives for further inquiry are identified and implications for investors and REIT managers are discussed.

Thesis Advisor: Timothy Riddiough
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Table of Contents

Abstract	2
Acknowledgements	3
Table of Contents	4
Chapter One: Background	6
Introduction	6
A brief history of REITS	9
REITS and Portfolio Investing	12
Chapter Two: Previous Literature	19
Chapter Three: Methodology	23
Introduction	23
Database	25
Step 1: Identification of Major Variables for the Thesis Study	27
Step 2: Identification of Data Sources	29
Step 3: Querying the Data sources and Thesis Database Creation	30
Step 4: Thesis Database Quality Check	34
Step 5: Importing Data into the Statistical Software	35
Step 6: Establish Regression Analysis Equations	35
Chapter Four: Results and Interpretation	38
Regression Results	38
Findings and Interpretation.	42
All REITS (with year dummy variables)	42
All REITS (with factors for the S & P and T-bills)	46

All REITS (without year dummies, S & P or T-bills)	48
All REITS (with S & P and T-bills) by sample range	48
REITS by property focus	51
Potential Bias	51
Chapter Five: Conclusions	53
Basic Interpretation	54
Further Inquiries	55
Final Thoughts	57
Appendix A: All variables included in the database	59
Appendix B: All data points and respective sources	60
Appendix C: All REITS within the database	62
Appendix D: REITS by property focus	66
Bibliography	72

FIRM LEVEL FACTORS THAT AFFECT RETURNS TO REAL ESTATE INVESTMENT TRUSTS

Chapter One: Background

Introduction

Historically, commercial real estate was most commonly owned by private individuals or by institutions. Ownership of individual properties was typically concentrated in a single institution or a relatively small group of individuals. The nature of real estate as a high cost, durable asset made it particularly desirable as a long-term investment by organizations such as insurance companies and high net worth individuals. Due to the relatively high transaction costs and the highly localized nature of the investment, real estate has never traded as frequently as financial assets such as stocks and bonds. When real estate does trade, the markets for its transfer have historically been fragmented and idiosyncratic. As a result, most commentators describe real estate as an illiquid investment.

Though real estate assets are somewhat similar in fundamental character (e.g. a structure for work or residence), the distinction by location renders real estate much less than perfectly fungible. Real estate has generally been considered as an inflation hedge and is virtually impossible to sell “short”. Accordingly, real estate evolved into an asset “class” that most investors considered to be quite separate from other types of assets. ¹

Real estate investors have historically accepted real estate’s lack of liquidity and typically were relatively indifferent to knowing its “value” at every instant in time. The valuation of real estate was really important to the owner only when they sold the asset or borrowed money that was secured by the realty. At those times third parties who were supposedly expert in the details of real estate valuation appraised the property. ² Appraisals were customized to a particular property and formed the baseline for negotiation of transactions and for certain regulatory compliance within the insurance and pension fund industries. In each event the valuation process was under the control and direction of the owners and provided a relatively smooth pattern of values.

On January 1, 1961, the pattern of both ownership and valuation of real estate began to change. On that day the Internal Revenue Code first permitted the exemption from entity level taxation for “real estate investment trusts” (REITS). This action finally placed real estate on a par with other asset “classes” such as stocks and bonds that for

¹ Skeptics argue that there are only two asset “classes”: the “risk free” asset and “risky” assets. Often the characterization of any asset as a “class” is generated by those with a vested interest (advisory or brokerage) in causing clients to commit and maintain investment dollars in that class.

² The three typical approaches were: income capitalization, replacement cost (with adjustment for depreciation) and “comparable” sales.

years had enjoyed the ability to be grouped into mutual funds for public trading and be untaxed at the organizational level so long as current dividends and capital gains were passed on to the owners of the fund. Prior to this legislation, taxation at both the entity level and the individual level (coupled with very high marginal rates of taxation) made public ownership of real estate impractical.

Favorable tax treatment for REITS came at the price of various limitations on ownership and distribution of income to the shareholders. In addition, certain organizational constraints on the activities of the trust were established.³ Over time the details of REIT regulation have changed, but the fundamental elements of the REIT structure remain in place. These constraints essentially compel REITS to access public capital markets frequently by the issuance of debt or equity securities if the REIT desires to grow its asset base. This tie to the public markets is a fundamental characteristic that defines the behavior of REITS.

REITS make it possible for real estate assets to be traded and valued within public markets in the same manner as other financial assets. By issuing shares, the REIT transforms the nature of real estate ownership in two major respects. First, it is now possible for the ownership to be fragmented among a large number of different individuals and organizations and traded frequently with low transaction costs. Second, the process of trading the REITS shares now renders a market judgment on the value of the firm and its underlying real estate. The implications of these two changes are quite

³ See Internal Revenue Code sections 856 to 860. For a good summary of REIT structural requirements, see Real Estate Finance and Investment, by Brueggman and Fisher (Irwin/McGraw-Hill, 1997)

significant for the understanding of real estate investment in particular as well as for the structuring of modern diversified investment portfolios. Interestingly, the consequences of these changes did not become apparent for decades following the creation of REITS as an alternative form of real estate ownership.

A Brief History of REITS

The growth of REITS immediately after 1961 was less than spectacular. Essentially, the industry did not have significant size until the late 1960's when REITS began to issue debt securities in substantial amounts and invest the resulting proceeds in development loans. REITS made highly leveraged investments without the benefit of the discipline that was applied to regulated lenders such as banks. This boom lasted until 1974 and was followed by a significant collapse as a result of a real estate recession. Many REITS went bankrupt and the few survivors spent years slowly rebuilding their capital base.

From 1976 until 1983, the REIT industry was relatively flat in terms of asset size. The inflationary era and easy credit allowed owners and developers significant access to capital in the private markets. There was no perceived advantage for a public market vehicle for real estate ownership and the tax laws created incentives for individuals to own real estate by allowing accelerated depreciation and by permitting passive losses on real estate to offset ordinary income of owners who often had high marginal personal

income tax rates. The entire value of the REIT industry during this time remained about \$7 Billion.

By 1984, REITS began to grow again. Changes in the tax laws eliminated various tax shelter provisions available to private owners and the national economic boom stimulated demand for capital to support real estate development. As a result, the mid-1980's was a period of rapid growth of REITS through both initial public offerings and by secondary offerings from existing REITS. ⁴

By the late 1980's, a national real estate recession had affected all forms of real estate ownership. Falling rents and occupancies coupled with rising expenses to eliminate substantial real estate equity value. This real estate depression precipitated a liquidity crisis for most owners of real estate. The liquidity problem was exacerbated by the national crisis in financial institutions and their regulation. Essentially, the national savings and loan structure dissolved and the banking and insurance industries withdrew from financing new real estate development in order to re-capitalize their core enterprises. During these years, many owners lost assets to foreclosure and institutional owners experienced negative returns on their real estate investments. REITS stagnated and declined in total capitalization.

After several years, the fundamental factors affecting real estate values began to change. Even though fundamentals were favorable, few of the historical investors in

⁴ For a good overview of REIT history, see: REIT Fact Book: The REIT Concept, 1989, The National Real Estate Investment Trusts, Inc.

real estate (e.g. pension funds and insurance companies) had any appetite for more of the asset “class” that had given them such indigestion for so many years. Since private capital markets would not fund real estate, the public markets filled the void.⁵ Beginning in 1992, the modern era of REITS was born. Over the next several years, private real estate portfolios were transformed into public securities at a rapid rate. This transformation was essential to creating some level of liquidity for real estate assets, and represented the only capital alternative for many owners and developers.⁶

Public capital sources infused REITS with cash at a time when national real estate markets were having a once in a life time “garage sale”. Aggressive REITS could acquire properties that would yield returns much greater than their cost of funds. As a result, the securities of these entities displayed dramatic gains. The gains were a response to the significant value created by purchasing properties at a substantial discount to their inherent value and attracted more investor interest in REIT securities.

Aggregate market capitalization of the REIT industry continued to grow rapidly until late 1997. Then, in 1998, REIT shares dropped in value dramatically when an international financial crisis brought capital markets to the point of breaking. Those who purchased REIT securities began to understand that the “low hanging fruit” had been picked. Since that time, REITS have not enjoyed the comparatively low cost of capital that fueled their early expansion. In addition, REIT securities have experienced substantial

⁵ Public markets had recently gained substantial experience with “securitization” of real estate assets as a result of the savings and loan “crisis”. That process essentially created the modern market for Commercial Mortgage Backed Securities (CMBS).

⁶ Vandell, Kerry D., 1998, “Strategic Management of the Apartment Business in a ‘Big REIT’ World,” *National Multifamily Housing*.

value erosion due to the inability to generate spectacular returns from purchasing assets at wholesale. As a result, the public capital markets essentially “red-lined” the industry and REITS ceased to be active competitors to buy properties. During 1998 and 1999, REITS traded at values that represented a substantial discount to the “net asset value” of their properties.⁷

This recent history of volatility in the public markets’ valuation of REITS contrasts sharply with what purports to be a more steady (if modest) record of increasing values for privately owned real estate. The different paths for aggregate returns on public and private real estate imply that the price of liquidity is volatility in asset values. Only since the start of the year 2000, have REITS begun to regain some of their lost value.

REITS and Portfolio Investing

REITS are now within the group of public market securities that are subject to analysis similar to other securities. The analysis of financial assets and investments is a complex undertaking. Resources of academia and industry are applied daily to determine where to invest both individual and firm resources to achieve the best risk adjusted returns. At the heart of this effort is the attempt to determine the “true” or “inherent” value of an asset and compare that value with the current market price for the asset. Armed with this knowledge, one might expect to make a few bucks.

⁷ “Net asset value” or NAV is a term of art intended to reflect the value of the firms’ real estate holdings in the private asset market. One may consider NAV as the value that would be described by a process of traditional appraisal.

Real assets and financial assets are typically valued on the basis of the discounting of current and expected future cash flows to determine a net present value. The estimation of those cash flows and the selection of an appropriate discount rate depend on countless assumptions. These assumptions are fundamentally grounded on various macroeconomic factors that affect all entities and also on factors unique to each particular entity. One articulation of the major categories of macroeconomic assumptions is as follows:

- Yield spread (the return on the government long bond less the return on the 30-day Treasury bills)
- Interest rate (change in Treasury bill return)
- Exchange rate (change in the value of the dollar relative to a “basket” of foreign currencies)
- Real GNP (changes in forecasts of GNP)
- Inflation (changes in the forecast of inflation)
- Market (an adjustment factor embracing the portion of market return not explained by the 5 macro factors) ⁸

Essentially, the function of capital markets is to apply the aggregate judgment about such macroeconomic factors to the circumstances of individual assets (with regard for their idiosyncratic characteristics) and generate a determination of present value. This process is applied to individual assets initially. When groups of assets are combined

⁸ Elton, E. J., M.J. Gruber and J. Mei, “Cost of Capital Using Arbitrage Pricing Theory: A Case Study of Nine New York Utilities,” *Financial Markets, Institutions, and Instruments*, (August 1994) 3, 46-73.

into a portfolio, the analysis moves to a higher level. The current approach at that higher level is often summarized as “modern portfolio theory”.

Modern portfolio theory is based on the assumption that there is a direct and proportional relationship between risk and returns on investments and that the firm level portion of those risks (i.e. the “idiosyncratic” risks) may be avoided by creation of a diversified portfolio. Whatever risk remains after diversification is considered to be “systematic”. To attract investors to accept the non-diversifiable, systematic risks, there must be some promise of a return in excess of that which can be obtained on a risk free asset. Understanding the appropriate “risk premium” for an investment is the search for the holy grail of finance. If one knows that premium, one can determine when an asset is trading at a price that is either too high or too low with respect to the fundamental risk of owning the asset. To determine that premium, financial theorists create models.

The capital asset pricing model (CAPM) is an early, popular expression of the relation of risk and return and the consequences of that relationship for the determination of prices for assets. Essentially, the CAPM assumes that a linear relationship exists between the returns on an asset and market returns; the expected returns on assets (particularly securities) within a particular universe are assumed to be a function of the asset’s “beta”.⁹ According to the CAPM, a perfectly diversified portfolio will produce a return that is given by the macroeconomic fundamentals that affect the value of all assets (financial and real). The firm specific or idiosyncratic factors affecting returns are diversified away in a perfectly diversified portfolio. These are the risks that the market

⁹ An asset’s “beta” is determined by comparing the returns to the asset with returns to the overall market.

prices when it sets a “required” return for a particular security. The required returns vary depending on the extent of risk (measured by a security’s variance) and the relation of the individual securities risk with the risk of the market portfolio (as measured by covariance of the individual security with the market).

The problems with the CAPM in practice have been noted as including the following: it assumes no transaction costs; it assumes that one can own a “market” portfolio, and it assumes relatively perfect flow of information. Obviously, the assumptions of the CAPM are not fulfilled in the real world. In addition, the empirical evidence supporting the CAPM is not persuasive.¹⁰ Accordingly, when structuring investment portfolios, it is fair to assume that diversification of idiosyncratic risks is not completely possible.

A more recent explanation of the asset pricing behavior of markets is Arbitrage Pricing Theory (APT).¹¹ APT asserts that a potentially infinite number of macroeconomic factors (including, perhaps, market portfolio returns) operate to explain stock returns. One study suggests that expected stock returns might be explained by the following major variables in the economy: (1) changes in the expected inflation, (2) changes in unexpected inflation, (3) unanticipated change in the term structure of interest rates, (4) unanticipated change in the risk premium, and (5) the growth rate in industrial production.¹² Presumably, commercial real estate is subject to the same factors.¹³

¹⁰ For a good summary of the past studies that question the CAPM see Chen, S., C. Hsieh, T.W. Vines and S. Chiou, “Macroeconomic Variables, Firm-Specific Variables and Returns to REITS”, *Journal of Real Estate Research*, (1998)

¹¹ Ross, S.A., “The Arbitrage Theory of Capital Asset Pricing”, *Journal of Economic Theory*, 1976, 341-60.

¹² Chen, N.F., R. Roll and S.A. Ross, “Economic Forces and the Stock Market”, *Journal of Business*, 1986, 59, 383-403.

One early study based on REIT data found that 60% of the variation in real estate returns could be explained through macro economic factors (with nominal interest rates accounting for 36% of returns).¹⁴

Both the CAPM and APT endeavor to explain security pricing/valuation from the “top down”. Each refers to the view of the relation of a security return to the market portfolio or to the macro economy. Essentially, both the CAPM and APT assume that idiosyncratic risks of individual securities may be diversified away within a portfolio. The remaining systematic risk affects investment returns and presumably is taken into account by the market pricing mechanism. That mechanism determines the appropriate risk premium for the components of the portfolio without taking separate account of firm level factors.

The prior research of securities returns in general suggests that firm specific factors will have some impact on relative risk adjusted returns and that the effect of these factors may not be captured by a single factor such as beta or by macroeconomic factors alone. In particular, it has been suggested that average stock returns over the last 50 years may not be explained by beta, once the factors of size and book to market equity are considered.¹⁵ If the various forms of “top down” valuation are not fully capable of capturing the impact of firm specific factors on security returns, then analysis of those

¹³ Ling, D. C. and A. Naranjo, “The Fundamental Determinants of Commercial Real Estate Returns”, *Real Estate Finance*, Winter 1998,

¹⁴ McCue, Thomas E. and John L. King, “Real Estate Returns and the Macroeconomy: Some Empirical Evidence from Real Estate Investment Trust Data, 1972-1991”, *The Journal of Real Estate Research*, Vol. 9, No. 3 (Summer 1994)

¹⁵ Fama, E.F. and K.R. French, “The Cross-Section of Expected Stock Returns”, *Journal of Finance*, 1992.

factors may yield valuable insights. Identification of the firm level variables that affect relative returns to securities can inform firm management of optimal choices for allocation of its assets and structure of its liabilities. That information can also grant investors better skill at forecasting market behavior.

This thesis acknowledges the contribution of “top down” approaches in valuing assets in general or REITS in particular. However, this thesis elects to explore a “bottom up” approach to valuation of REIT securities. This approach is based on firm specific variables that are capable of being expressed in quantifiable terms. This firm level inquiry is simply a different approach to attempting to understand the process of valuation of real estate assets by the public markets. This different approach focuses on the total returns not merely on equity returns. In doing so, this thesis attempts to structure the analysis to remove the affects of the general market or the macroeconomic factors.

It is axiomatic that macroeconomic factors materially impact the returns to all real estate. The macro factors clearly affect REIT returns, but the factors are essentially beyond the control of the REIT. In addition, macroeconomic factors are difficult to quantify, *ex ante*, since they depend upon estimates and predictions about which there is not unanimity of opinion. Finally, each REIT should experience the same impact of these factors, though the response of the REIT return to the factors will not necessarily be the same over time or across REITS. Firm level factors, however, are within the

control of the REIT and join with the effects of the general economy to provide the inputs that are processed by the market in reaching a valuation of the REIT.

Basically, public markets pass judgment on the value of a REIT and its assets every trading day. The judgment of the market is expressed in a trading price for its shares. At the end of any period of time, one may sum up the market's judgment and calculate the return to capital for the REIT. But, the answer of how well the REIT performed in financial terms is merely a reflection of the markets judgment based on the aggregate of factors that affect value. It does not disclose what firm level constituent elements, if any, were relevant to that judgment after accounting for the general economy and broader markets behavior. This thesis is a search for some of those variables.

Chapter Two: Previous Literature

Several papers have examined the complexity of evaluating returns of equity REITS. In one article it was recognized that returns to equity REITS, though greatly influenced by movements in the stock and bond markets, remained linked with the performance of the underlying real estate assets.¹⁶ The differences between reported returns for public and private real estate were examined in another article and it was concluded that the reported difference in public and private rates of real estate return was explained by the fundamentally different valuation methods used in the two markets.¹⁷

Several prior inquiries have been made into the factors affecting real estate returns in general and into returns on REITS. For example, an examination was made to identify factors in the overall economy that affect real estate returns.¹⁸ In addition, that work recognized the existence of conditioning factors such as dividend yield and firm size that were relevant to explaining the risk premium to real estate. Additional inquiry into the firm level determinates of returns was reflected in an article that identifies the role of

¹⁶ Giliberto, S. Michael "Equity Real Estate Investment Trusts and Real Estate Returns," *The Journal of Real Estate Research*, Vol. 5, Number 2 (Summer 1990).

¹⁷ Giliberto, Michael and Anne Mengden, "REITS and Real Estate: Two Markets Reexamined," *Real Estate Finance*, Spring 1996.

¹⁸ Ling, David C. and Andy Naranjo, "The Fundamental Determinants of Commercial Real Estate Returns," *Real Estate Finance*, Winter 1998.

several firm level factors in determining risk adjusted returns.¹⁹ In fact the data analysis of that work implied that 66% of the “excess” returns of REITS might be explained by firm specific variables and that only 34% of “excess” returns is due to systematic risks.²⁰ The firm level factors that were examined were: debt/equity, FFO payout, EBITDA, FFO multiple, CAD multiple (cash flow adjusted for depreciation), size (market capitalization), dividend yield, and percent insider equity.²¹ The results indicated that only firm size had a significant negative correlation with firm specific risk.

Several efforts have been made to identify the significance of such factors. One work reported on a specific inquiry into equity REIT response to both macroeconomic factors and firm specific variables.²² The findings were based on equity REITS during the period 1978-1994 and examined the firm specific variables of “size” and “book to market equity”. The authors reported that their analysis suggested rejection of the CAPM as satisfactory explanation for variation of returns over the universe of equity REIT stocks that were examined. There was a finding of significance of firm size in pricing of the securities over time.

¹⁹ Litt, Jonathan, Jianping (J.P.) Mei, and the Paine Webber REIT Team, “A Risk Adjustment Model for REIT Evaluation,” *Real Estate Finance*, Spring 1999.

²⁰ Excess returns are those that exceed the risk free rate and are required to compensate for non-diversifiable risks.

²¹ FFO is funds from operations; EBITDA is earnings before income taxes, depreciation and amortization; CAD is cash flow adjusted for depreciation.

²² Chen, Su-Jane, Chengho Hsieh, Timothy W. Vines, and Shur-Nuann Chiou, Macroeconomic Variables, Firm-Specific Variables and Returns to REITS,” *Journal of Real Estate Research*, Vol. 16, No. 3, 1998.

More recently an examination was made concerning the impact of size and portfolio diversity on performance.²³ The work suggested that though the CAPM may explain time series returns to individual REITS, it would not explain cross-sectional average returns. The work also concluded that geographic diversification and property type specialization are related to cross-sectional average returns.

Each of the prior inquiries into firm level determinates of REIT performance was based on equity returns and addressed a few independent firm level variables. This thesis is an effort to examine “de-levered” results by focusing on total returns and expand the number of factors that are subject to analysis. In addition, the data forming the basis for this thesis covers a longer period of time than some previous studies and encompasses periods of significant change in underlying macroeconomic factors as well as years of significant volatility in both REIT securities and stocks in general. In that sense, this thesis is a logical extension of the prior work of others and attempts to explore new territory.

The first step in that exploration was to define a universe of firms to be the subject of analysis. The general intent of this thesis is to examine securities that were issued by equity REITS that represented a pool of underlying equity real estate assets. The fundamental character of equity securities is identical to that of commercial real estate that is privately held or owned by institutions. The underlying assets of each are equity interests in “real property”. Investments in real properties have theoretically unlimited

²³ Chen, Jun and Richard Peiser, “The Risk and Return Characteristics of REITS 1993-1997,” *Real Estate Finance*, Spring 1999.

upside potential and their downside risk is normally limited to the loss of the entire investment. In addition, the same factors affect financial performance at the asset level for both REITS and private owned realty.²⁴ The difference between the two is grounded in the fact that REITS have their values determined by the public markets and private real estate is valued, if at all, by private appraisal. In addition, the REITS have an overlay of firm level characteristics that complicate the analysis of the valuation process. In particular, REITS may have liabilities or assets at the firm level that are not found at the asset level for privately owned realty. In order to examine those factors, a specific methodology was applied. The next chapter describes that methodology in detail.

²⁴ "Location, location, location" and "buy low/sell high".

Chapter Three: Methodology

Introduction

A fundamental assumption of this thesis is that the return to capital invested in REITS is a function of the risks of those investments and the potential rewards to those taking the risks. The reward for risk taking is a return on the investment. The risks of the investment are the sum total of all factors that impact the return. The equation for that relationship is:

$$\text{Return} = c + \beta_1 * x_1 + \beta_2 * x_2 + \dots + \beta_n * x_n$$

Where return is the dependent variable, C is constant, $\beta_1, \beta_2 \dots \beta_n$ are coefficients, and $x_1, x_2 \dots x_n$ are the independent variables. This equation is a theoretical construct that expresses all the potential universe of factors that bear on the return to a particular asset. Returns begin with an expected base rate and are adjusted based on additional variables that affect the investment. The impact of each discrete factor is represented by the coefficient of the factor and the sign of the coefficient gives the direction of the impact. This basic relationship is the starting point for a search for determinates of return.

For a particular real estate asset, the basic determinates of return would include location, physical condition, agreed cash flows under a lease, the risk free interest rate,

growth of the national economy, local competition, and so forth. For REITS, this equation would capture the cumulative impact of such asset level factors for each property owned by the REIT. In addition, for REITS, the formula will capture the firm level factors that operate in collaboration with the asset level variables. Obviously, no one will ever articulate a comprehensive list of such factors. However, basic economic and finance theory do permit major determinates of return to be identified and examined.

Making an examination of determinates of return begins with the question: How does one measure returns to an asset? In this regard, the primary measure of the reward to an asset is the concept of aggregating the returns to the all components of the asset. For individual real estate investments such as an apartment building or a warehouse, this process involves summing up and discounting the past and expected future cash flows for the items of income and expense and reaching a total. The total then is compared to the invested capital and the result is a calculation of return. For securities such as REITS the process involves looking at the entity level rather than the individual assets.

The two primary elements that together constitute the total capitalization of the REIT are equity and debt. The prototypical method for expressing combined returns for equity and debt is the concept of "Weighted Average Cost of Capital" or "WACC". The formula for WACC can be expressed as follows:

$$WACC = R_a = \left\{ \frac{D}{V} \times R_d \right\} + \left\{ \frac{E}{V} \times R_e \right\}$$

Where R_a is the return on the asset, R_d is the return on the debt, R_e is the return on the equity, D is the value of the debt, E is the value of the equity and V is the value of the asset (i.e. the sum of the debt and the equity). The basic concept of WACC forms the starting point for examination of REIT returns and their determining factors.

In application to the historical data on REITS, the equity component of the basic WACC formula must be decomposed to reflect the existence of preferred stock and “operating partnership units” (“OPU’s”).²⁵ Preferred stock is technically a form of equity, but it also has characteristics of debt. As a practical matter, OPU’s are the functional equivalent of common shares. The data collected for this thesis includes the portion of firm capitalization consisting of preferred stock and OPU’s as well as the debt and common shares.

Database

To study the firm level determinates of total return this thesis creates a database by following a methodology that is composed of the following steps:

²⁵ Issuance of OPU’s in exchange for real estate assets is a means of acquiring real estate without causing an immediate taxable event for the seller. OPU’s are convertible to common shares of REIT stock and have an equity ownership claim.

<u>Step</u>	<u>Description</u>	<u>Data Source/Tool</u>
Step 1	Identify major variables	Discussions with industry professionals and Thesis Advisor
Step 2	Identify data sources	SNL DataSource, Zephyr Associates, Inc., and IDC database (via FactSet)
Step 3	Querying Data Sources and Thesis Database Creation	SNL DataSource, Zephyr Associates, Inc., IDC database (via FactSet), Microsoft Excel
Step 4	Thesis Database Quality Check	Bloomberg, Edgar, FactSet, and a previous thesis database
Step 5	Importing Data from Microsoft Excel to E-Views Software	Microsoft Excel, E-Views
Step 6	Establish Regression Analysis Equations	E-Views

These steps are described in this chapter. The following chapter reports and interprets the results of the analysis performed in accordance with the above methodology.

Step 1: Identification of Major Variables for the Thesis Study. Prior to obtaining any data, a list of major firm level variables was identified. The inquiry of this thesis involves total returns, so it was necessary to obtain the annual total returns for all firms that are the subject of this study. (Annual total returns are the dependent variable in the analysis.) An extensive number of firm level independent variables were identified from the balance sheet and the income statement. Following further consideration and analysis, the final list of independent variables was refined to a study list that forms the basis of the analysis. The entire list of variables obtained is set out in Appendix A.

The study list contains various balance sheet items including various asset and liability categories, and one income statement item - dividend payout ratio. In addition non-firm level data were gathered pertaining to the annual Standard and Poor's 500 (S & P) index total returns and the average annual returns on 90-day U. S. Treasury bills (T-bills). A summary of the study data is set out below:

Historical Data Period: 1990-1999

Dependent Variable: Total Return (as reflected by the *ex post* Weighted Average Cost of Capital.)

Independent Variables: Classified as Group 1 and Group 2 based on whether the variable is related to total assets excluding accumulated depreciation or total assets including accumulated depreciation.

The list of variables in each group is as follows:

Group 1

I.D.	Variables
pfr	Prop Focus Dummy Variable Retail-1, other-0
pfo	Prop Focus Dummy Variable Office-1, other-0
pfs	Prop Focus Dummy Variable Residential-1, other-0
pfi	Prop Focus Dummy Variable Industrial-1, other-0
ta	Total Assets
ag1	Asset Growth w/o adding back Accrued Depreciation
td1	Total Debt w/ Preferred /Total Assets
td2	Total Debt w/o Preferred /Total Assets
sd	Secured Debt /Total Debt
cla1	Credit Lines Available /Total Assets
tpf1	Total Preferred /Total Assets
dpr	Dividend payout ratio (div/FFO)
msd1	Maturity Structure of Debt (S-T) <1yr/TOTAL DEBT
msd5	Maturity Structure of Debt (5+yrs)/TOTAL DEBT
vrđ	Variable-rate Debt/TOTAL DEBT
sp	S&P 500
tbill	T-bills
year1991	1991 year dummy
year1992	1992 year dummy
year1993	1993 year dummy
year1994	1994 year dummy
year1995	1995 year dummy
year1996	1996 year dummy
year1997	1997 year dummy
year1998	1998 year dummy
year1999	1999 year dummy

Group 2

pfr	Prop Focus Dummy Variable Retail-1, other-0
pfo	Prop Focus Dummy Variable Office-1, other-0
pfs	Prop Focus Dummy Variable Residential-1, other-0
pfi	Prop Focus Dummy Variable Industrial-1, other-0
taad	Total Assets plus Accrued Depreciation
ag2	Asset Growth adding back Accrued Depreciation
tdp1	Total Debt w/ Preferred /Total Assets plus Accrued Depreciation
tdp2	Total Debt w/o Preferred /Total Assets plus Accrued Depreciation
sd	Secured Debt /Total Debt
cla2	Credit Lines Available /Total Assets plus Accrued Depreciation
tpf2	Total Preferred /Total Assets plus Accrued Depreciation
dpr	Dividend payout ratio (div/FFO)
msd1	Maturity Structure of Debt (S-T) <1yr/TOTAL DEBT
msd5	Maturity Structure of Debt (5+yrs)/TOTAL DEBT
vrđ	Variable-rate Debt/TOTAL DEBT
sp	S&P 500
tbill	T-bills
year1991	1991 year dummy
year1992	1992 year dummy
year1993	1993 year dummy
year1994	1994 year dummy
year1995	1995 year dummy
year1996	1996 year dummy
year1997	1997 year dummy
year1998	1998 year dummy
year1999	1999 year dummy

Step 2: Identification of Data Sources: Following discussions with industry

professionals and performance of preliminary data research, SNL DataSource was identified as the major source for creation of the Thesis Database. The study focused on public equity REITS tracked by SNL DataSource.

Other data sources that were identified include Zephyr Associates, Inc., and IDC database (via FactSet - an interface software application). Appendix B contains a brief description of data points within the Thesis Database and respective sources.

Step 3: Querying Data Sources and Thesis Database Creation: The next step involved a query to the various data sources. The process included selecting specifications, exporting data from the data sources to a Microsoft Excel workbook, setting up formulas, and creating the Thesis Database using the spreadsheet application.

Further steps were undertaken to refine the aggregate database to arrive at the final Thesis Database. The first adjustment involved identifying REITS asset type focus.

Next it was determined to exclude all REITS in the following categories:

- Mortgage (Primary assets are mortgages issued in connection with real estate.)
- Hybrid—(A mixed collection of mortgages and equity real estate holdings)
- Hospitality—(Focus on lodging and resort accommodations.)
- Health Care—(Own health care facilities)
- Corrections—(Own and lease prison facilities)
- Other non-standard focus—(Own timber lands subject to harvesting or antennas that are rented to communications companies)
- Self-liquidating—(Those with a stated purpose of selling all assets and ceasing operations.)
- REITS have disappeared due to merger or liquidation—(This limitation was necessitated by the availability of data from the data base.)

- REITS that did not have REIT status for all of the study period (e.g. those that operated as taxable entities for a substantial period of the study)

Elimination of the above categories of REITS resulted in a universe of entities that were grouped by investment focus as follows: Office, Residential, Industrial, Retail, and Other.²⁶ The “other” category includes: diversified/other, recreation, restaurant, and self-storage. These groupings facilitate the creation of property focus dummy variables.

The above refinement resulted in 143 REITS included in the Thesis Database for each year from 1990 to 1999. Although there were 143 REITS in the study group at the end of 1999, many of the REITS did not exist during the entire study period. The major years for addition of new REITS were the initial public offering boom of 1993-1994. The following table illustrates the progressive increase in the number of REITS during the study period from the base number of 46 in 1990:

²⁶ The source of information for the categories of REITS was the SNL database as well as the REIT handbook. Determination of categories was made effective as of 1999 and was applied to all years of data within the study. No attempt was made to correct for changes of category over time. Such changes are not material in number or in absolute value based on the quantity of assets affected.

Year	New REITS	Cumulative Total
1991	3	49
1992	2	51
1993	31	82
1994	31	113
1995	3	116
1996	4	120
1997	17	137
1998	6	143
1999	0	143

See Appendix C for a complete list of REITS and their stock ticker symbols. Appendix D contains lists of REITS by property focus.

A second major adjustment to the data was done to create the dependent variable of total return (WACC). Calculation of this variable was done as follows:

$$R_{a,t} = (R_{e,t} \times W_{e,t}) + (R_{d,t} \times W_{d,t}) + (R_{p,t} \times W_{p,t})$$

Where

R_e : ex post returns on common equity

R_d : ex post returns on debt

R_p : ex post returns on preferred equity

W_e : weight of equity expressed by percentage of average equity capitalization over average total market capitalization

W_d : weight of debt expressed by percentage of average debt outstanding over average total market capitalization

W_p : weight of preferred equity expressed by percentage of average preferred equity capitalization over average total market capitalization

The three components of weighted average total return, including weighted returns of common equity, weighted returns of debt, and weighted returns of preferred equity were calculated as follows:

Common Equity:

$$R_{e,t} = ((p_t - p_{t-1}) + d_t) / p_{t-1}$$

$$W_{e,t} = (E_t / (E_t + D_t + PP_t))$$

Where:

p_t = stock price at year end t

p_{t-1} = stock price at year end t-1

d_t = total dividends in year t

E_t = average total equity capitalization at year end t and at year end t-1

D_t = average total debt outstanding at year end t and at year end t-1

PP_t = average total preferred equity capitalization year end t and at year end t-1

Debt:

$$R_{d,t} = i_t/D_t$$

$$W_{d,t} = D_t/(E_t+D_t+PP_t)$$

Where:

i_t = interest expense in year t

D_t = average total debt outstanding in year t and year t-1

Preferred Equity:

$$R_{p,t} = pd_t/PP_t$$

$$W_{p,t} = PP_t/(E_t+D_t+PP_t)$$

Where:

pd_t = total preferred dividends paid in year t

PP_t = average total preferred capitalization at year end t and year end t-1

Step 4: Thesis Database Quality Check: Upon the completion of the Thesis Database, efforts were undertaken to check the quality of the database. Various variables were randomly checked against information obtained from sources such as Bloomberg, Edgar, and FactSet.

In addition, the data generated for a prior thesis²⁷ was compared to the Thesis Database to check for accuracy. Numerous observations of common variables were

²⁷ Moriarty, Mark P. and Pennock J. Yeatmen IV, "Risk-Adjusted Performance History of Public and Private Market Real Estate Investments 1978-1997", September 1999.

compared to validate the Thesis Database. After accounting for certain differences in methodologies, the Thesis Database was determined to be reliable.

Step 5: Importing Data into the Statistical Software: The next step involved importing the data from Microsoft Excel to an appropriate statistical software application. The product that was selected is E-Views (version 3.1) ²⁸. Towards this end, a separate Excel worksheet was created to stack the cross section, time-series data according to the years (1990-1999).

Step 6: Establish Regression Analysis Equations: The quantitative inquiry of this thesis was executed by applying a statistically based regression analysis to various combinations of variables within the thesis database. Regression analysis is the fundamental econometric tool for identification and quantification of the relationship of various financial factors in the determination of returns to assets. Application of that tool to REIT returns requires creation of an appropriate dependent variable and the selection of appropriate independent variables. The basic regression formula selected for estimation was:

$$WACC = c + \beta_1 * x_1 + \beta_2 * x_2 + \dots + \beta_n * x_n$$

Where WACC is the dependent variable, C is a constant, $\beta_1, \beta_2 \dots \beta_n$ are coefficients and $x_1, x_2 \dots x_n$ are the independent variables. The collected data was then organized for inclusion in the above equation.

²⁸ Eviews is published by Quantitative Micro Software of Irvine California.

The data contained in the Thesis Database were segregated into the two basic groups described above in step 1. The primary distinction between the groups was the presence or absence of accumulated depreciation in the capitalization of the REIT.²⁹ Within each group, property focus dummy variables were added to identify four major categories of real estate held. Use of property focus dummy variables acts as a risk control and should eliminate bias in the results due to property focus. Dummy variables were also set up for each year from 1991 to 1999. Finally, the two data groups were applied to the dependent variable to test for the presence of a statistically significant relationship between WACC and those firm specific independent variables within each group.

The regression analysis was conducted in three basic scenarios. In the first scenario, the independent variables were applied with the addition of year effect dummy variables. Use of year dummy variables is intended to adjust the equation results to isolate the impact of macroeconomic factors. In the second scenario, the independent variables were used without year dummies but with variables that reflect the total annual return of the Standard & Poor's 500 Index (S & P) and the 90-day rate on U.S. Treasury Bills (T-bill) during each of the years of the sample period. Adding the annual returns for the S & P index and T-bill rates should adjust the regression results to isolate the

²⁹ Depreciation is an accounting concept that is relevant for a number of purposes such as taxation and reporting of income for financial purposes. When one attempts to determine the value of an asset, adding in the depreciation to the "book" value of the asset allows more of an "apples to apples" comparison of asset values across REITS.

impact on returns that is attributable to general market returns. The third scenario was conducted without any attempt to adjust for macroeconomic factors or market behavior.

Following creation of the variable groups and regression scenarios, regression equations were estimated for the various relationships of WACC and independent variables. The estimated equations were structured to eliminate variables within either group that produced a singular matrix as a result of highly correlated independent variables. The refined groups of variables were then applied to the different scenarios.

Application of the revised regression formulas to the variables within the Thesis Database produced various regression results. Results were obtained for all REITS within the scope of the study as well as for subgroups of REITS based on property focus. In addition, various different sample time periods were examined. The regression outputs were considered to be significant if the “t-stat” for a coefficient had an absolute value of over 1.96 (i.e. significance at a 95% confidence interval). The following chapter contains the regression outputs and interprets those outputs in light of the character and history of REITS.

Chapter Four: Results and Interpretation

Regression Results

The results and analysis of regressions conducted for all REITS are set in this chapter. Three basic scenarios were run for all REITS. Each includes dummy variables for property focus and a common collection of individual variables. The first regression scenario also includes the year effect dummy variables. The second regression includes market variables for the historical total returns of the S & P and 90-day T-bill rate. The third excludes both year dummy variables and market variables. An analysis and interpretation of the results follows the three regression outputs.³⁰

³⁰ The regressions for the Group 2 variables produced substantially similar results to those reported for the Group 1 variables. Detailed regression outputs for Group 2 variables are omitted so as to avoid redundancy.

Regression results with Group 1 variables, property focus dummy variables and year dummy variables.

Dependent Variable: Weighted Average Cost of Capital (WACC) (ex poste)

Method: Pooled Least Squares

Date: 07/20/00 Time: 22:03

Sample: 1990 1999

Included observations: 10

Number of cross-sections used: 137

Total panel (unbalanced) observations: 552

Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-33.80739	9.573386	-3.531393	0.0004
Retail Focus	-2.203437	1.264212	-1.742933	0.0819
Office Focus	-1.076131	1.452344	-0.740961	0.4590
Residential Focus	-2.411605	1.376167	-1.752407	0.0803
Industrial Focus	-0.244931	1.618707	-0.151312	0.8798
Total Assets	-0.015875	0.029134	-0.544879	0.5861
Asset Growth	0.048851	0.005716	8.547006	0.0000
Total Debt + Preferred/Total Assets	-0.114141	0.027405	-4.164944	0.0000
Secured Debt/Total Debt	0.041241	0.013612	3.029853	0.0026
Credit Line Available/Total Assets	-0.023695	0.043821	-0.540721	0.5889
Total Preferred/Total Assets	0.151484	0.056991	2.658045	0.0081
Dividend Payout Ratio (dividend/FFO)	-0.011814	0.008306	-1.422364	0.1555
Debt<1 Year Maturity/Total Debt	-0.010473	0.030544	-0.342874	0.7318
Debt>5 Year Maturity/Total Debt	0.007977	0.020004	0.398795	0.6902
Variable Rate Debt/Total Debt	-0.047866	0.024177	-1.979841	0.0482
YEAR1991	68.18170	10.50531	6.490213	0.0000
YEAR1992	48.61573	9.972755	4.874855	0.0000
YEAR1993	54.06571	9.910441	5.455429	0.0000
YEAR1994	43.52313	9.598093	4.534560	0.0000
YEAR1995	51.92642	9.545406	5.439939	0.0000
YEAR1996	62.42011	9.552364	6.534519	0.0000
YEAR1997	54.04295	9.545350	5.661705	0.0000
YEAR1998	37.63615	9.552346	3.939990	0.0001
YEAR1999	43.30893	9.537464	4.540927	0.0000
R-squared	0.563457	Mean dependent var	10.51635	
Adjusted R-squared	0.544441	S.D. dependent var	13.84414	
S.E. of regression	9.344114	Sum squared resid	46100.98	
F-statistic	29.63058	Durbin-Watson stat	2.279772	
Prob(F-statistic)	0.000000			

Regression results with Group 1 Variables, property focus dummy variables and variables for the annual total returns of the S & P and T-bills

Dependent Variable: Weighted Average Cost of Capital (WACC) (ex poste)

Method: Pooled Least Squares

Date: 07/20/00 Time: 22:12

Sample: 1990 1999

Included observations: 10

Number of cross-sections used: 137

Total panel (unbalanced) observations: 552

Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.730537	7.440453	-0.770187	0.4415
Retail Focus	-1.008423	1.658792	-0.607926	0.5435
Office Focus	-2.270149	1.899258	-1.195282	0.2325
Residential Focus	-3.065796	1.800471	-1.702774	0.0892
Industrial Focus	-0.501500	2.116331	-0.236967	0.8128
Total Assets	-0.110567	0.036904	-2.996097	0.0029
Asset Growth	0.054289	0.007175	7.566105	0.0000
Total Debt + Preferred/Total Assets	-0.176311	0.034978	-5.040599	0.0000
Secured Debt/Total Debt	0.045026	0.017763	2.534842	0.0115
Credit Line Available/Total Assets	-0.038661	0.056741	-0.681351	0.4959
Total Preferred/Total Assets	0.115241	0.074646	1.543818	0.1232
Dividend Payout Ratio (dividend/FFO)	-0.010989	0.010890	-1.009079	0.3134
Debt<1 Year Maturity/Total Debt	-0.030823	0.039608	-0.778193	0.4368
Debt>5 Year Maturity/Total Debt	0.036347	0.026156	1.389606	0.1652
Variable Rate Debt/Total Debt	-0.079958	0.031525	-2.536331	0.0115
S&P 500 Index	-0.029065	0.092360	-0.314686	0.7531
90 Day T-bill rate	4.940850	1.689646	2.924193	0.0036
R-squared	0.233705	Mean dependent var	10.51635	
Adjusted R-squared	0.210787	S.D. dependent var	13.84414	
S.E. of regression	12.29880	Sum squared resid	80924.41	
F-statistic	10.19776	Durbin-Watson stat	2.152992	
Prob(F-statistic)	0.000000			

Regression results with Group 1 variables including only property focus dummy variables:

Dependent Variable: Weighted Average Cost of Capital (WACC) (ex poste)

Method: Pooled Least Squares

Date: 07/20/00 Time: 22:16

Sample: 1990 1999

Included observations: 10

Number of cross-sections used: 137

Total panel (unbalanced) observations: 552

Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
	t			
C	17.48941	3.184304	5.492380	0.0000
Retail Focus	-0.866487	1.683577	-0.514671	0.6070
Office Focus	-2.112066	1.926391	-1.096385	0.2734
Residential Focus	-2.674088	1.825460	-1.464884	0.1435
Industrial Focus	-0.073966	2.146131	-0.034465	0.9725
Total Assets	-0.119752	0.037377	-3.203860	0.0014
Asset Growth	0.055584	0.007249	7.667309	0.0000
Total Debt + Preferred/Total Assets	-0.171848	0.035489	-4.842241	0.0000
Secured Debt/Total Debt	0.049377	0.017996	2.743814	0.0063
Credit Line Available/Total Assets	-0.021959	0.057503	-0.381878	0.7027
Total Preferred/Total Assets	0.123100	0.075714	1.625856	0.1046
Dividend Payout Ratio (dividend/FFO)	-0.009959	0.011062	-0.900303	0.3684
Debt<1 Year Maturity/Total Debt	-0.042536	0.040087	-1.061101	0.2891
Debt>5 Year Maturity/Total Debt	0.039900	0.026550	1.502807	0.1335
Variable Rate Debt/Total Debt	-0.084570	0.031936	-2.648129	0.0083
R-squared	0.206051	Mean dependent var	10.51635	
Adjusted R-squared	0.185352	S.D. dependent var	13.84414	
S.E. of regression	12.49542	Sum squared resid	83844.74	
F-statistic	9.954716	Durbin-Watson stat	1.996586	
Prob(F-statistic)	0.000000			

Findings and Interpretation

The observations expressed in the above regression outputs may be summarized in a series of findings. Significant independent variables may have a positive or negative relationship with total returns. Findings are considered statistically significant at 95% confidence level if the absolute value reported “t-stat” for the independent variable exceeds 1.96.

Based on the findings, it is possible to suggest a number of interpretations about the verdict that the market process has rendered about various firm level factors displayed by the REITS. The findings and interpretations for all REITS are discussed below.

Findings and interpretations for regressions on pools of REITS based on property focus are set out following the all REITS discussion. The interpretations of the results are suggestions based on the nature of the independent variable and its most probable relevance on the markets judgment of appropriate return to capital. Basically, the interpretations are an effort to ascribe meaning and rationale to the markets action and its consequences.

All REITS (with year dummy variables):

Findings: For all REITS, when returns are considered along with property focus and year dummy variables, the results of the regression reflect a positive impact to returns attributed to: (i) increasing growth of total firm assets, (ii) increasing proportion of

secured debt to total debt, and (iii) increasing ratio of total preferred stock to total assets. Negative impacts to returns are associated with: (i) increasing magnitude of total debt (including preferred) to total assets, (ii) increasing share of short-term debt as a portion of total debt, and (iii) increasing share of variable rate debt as a portion of total debt.

Interpretation of positive variables:

Asset growth. The consistent contribution to returns based on increasing asset growth can be attributed to the ability of acquisitive REITS to obtain bargains in the real estate property market. In addition, growth of the asset base allows for some firm level economy of scale for organizational level expenses. REITS have in some cases increased their size by merger with other REITS as well as by engaging in development opportunities. Capacity to grow by either method is an endorsement of the strategy of the REIT and brings the reward of higher returns.

Secured debt. The positive impact of secured debt is interesting to note especially in view of the negative impact of total debt. The most obvious explanation for that result is that high levels of secured debt may be highly correlated with lower total debt. If that is the case, then rewarding high relative levels of secured debt is simply the mirror image of penalizing high levels of total debt.

An additional explanation can be based on the differences between secured and unsecured debt. First, secured debt is typically underwritten based on asset level fundamentals. The borrower may strategically default on secured debt on an asset-by-asset basis. This default option has value for the REIT even if the asset is currently worth more than the amount of the debt.³¹ Also, secured debt typically exhibits substantially longer durations than unsecured debt. Creation of secured debt normally involves transactions costs higher than those of unsecured debt.

Due to these differences, secured debt is part of the long-term capitalization of a REIT. Unsecured debt is part of a shorter-term capital strategy and is often an interim form of financing used to fund acquisitions until an equity issuance is possible. The presence of high levels of unsecured debt represents a peril for returns because of interest rate risk if the debt must be refinanced in an environment of rising interest rates. In addition, there is the potential for dilution of existing equity holders if shares must be sold to fund the payment of the debt. Finally, it represents a potential claim on all firm assets and thus there is no option to strategically default on selected assets.

Total Preferred. The positive impact of increasing levels of preferred stock can be explained by considering the distinctions between preferred stock and debt. If the firm experiences financial distress, it has greater flexibility to protect cash flows by suspending payment of preferred dividends. Suspension of preferred dividend payments is not a default, while failure to pay interest on debt is a default. This

³¹ In a sense, this option value is analogous to a put or call option on a stock that trades for some value even when it is well "out of the money". The major difference with secured debt default options is their quite lengthy option period (i.e. until the debt is finally due and payable.)

increased flexibility accounts for higher returns since the firm is able to pursue valuable opportunities with a more flexible capital structure.

Interpretation of negative variables.

Total debt with preferred. The negative impact of total debt plus preferred as a percentage of total assets reflects the markets judgment that the costs of financial distress outweighing the benefits of leverage. This is particularly true for REITS since the tax shield of the deductibility of interest expense is not applicable. In addition, the higher debt levels impair a REITS ability to be opportunistic. Finally, a review of recent REIT history discloses that the market penalized firms that continued to acquire assets after the buyers market of the early 1990's came to an end. High debt levels likely coincide with firms that made purchases that did not yield a positive net present value. Such purchases were often justified by the short-term "accretive" nature of acquisitions made when share prices were very high. Over time, the markets punished such ill-advised purchases and returns fell. (A similar interpretation would apply to the variable for total debt without preferred.)

Short-term debt. The penalty to returns based on increasing levels of short-term debt indicates that the costs of interest rate risk and refinancing risk outweigh the benefits of leverage. Higher short-term debt levels may also be indicia of the inability of the firm to obtain favorable secured financing and the inability to issue equity at satisfactory prices.

Variable debt. Variable rate debt poses the risk of increasing interest rates and the resulting uncertainty to cash flows. Penalization of returns based on this variable is likely in view of the reduced ability of the firm to exploit opportunities and the increased exposure to rising interest rates.

All REITS (with factors for the S&P and T-bills)

Findings: For all REITS, when variables for the annual total returns of the S & P and T-bills are included in the regression equation, the results indicate consistent *positive* impacts on returns for the following variables: (i) asset growth, (ii) secured debt as a share of total debt and (iii) increasing T-bill rates. *Negative* impacts were (i) total assets, (ii) total debt (with preferred) as a share of total assets, and (iii) variable rate debt as a share of total debt.

Interpretation of positive variables:

Asset growth and Secured Debt: The explanations for these variables would be the same as those above for the regressions conducted with year dummy variables.

T-bills. The positive impact on returns for rising T-bill rates is of particular interest since it is often assumed that rising interest rates are a negative to returns because of the increasing discount rate for cash flows. This is certainly the case for most securities, especially the ones with relatively high debt levels or significant amounts of short-term

debt or variable rate debt. Increasing interest expense and higher discount rates negatively impact values and returns. Real estate held by REITS is a durable asset that hedges against inflation. As such, increasing interest rates can positively impact REIT returns for both market reasons and for reasons associated with the nature of the asset.

When security markets generally are negatively impacted by rising interest rates, REITS represent a “safe haven” for capital. Sector rotation of capital into REITS during periods of rising rates can offset the otherwise negative effect on returns. At the asset level, rising rates retard development of new properties and reduce the risk of overbuilding.³² This reduction of risk to future rents and occupancy levels of existing assets may well offset the incremental increase in the rate at which those future cash flows are discounted. In addition, if rising short-term rates are a sign of inflation, then the inflation hedging potential of real estate also works to overcome the increase in the rate at which potential cash flows are discounted.

Interpretation of Negative Variables:

Total assets: The negative impact of increasing total assets evidences a penalty for large size and implies that the “small firm” effect observed in broader markets also exists among REITS. The adverse impact of size may relate to the impact of institutional investor behavior. Past studies have indicated that the preference of institutional investors for larger capitalization securities coupled with the tendency to buy

³² Uncertainty of future supply is a major risk factor for all real estate.

or sell “en mass” would explain the potential for extreme behavior of prices.³³ In view of the last several years of falling REIT prices, this institutional investor impact probably explains a portion of this result. In addition, on a more fundamental level, lower returns for size are logical since greater diversification and potential economies of scale reduce firm risk.

Variable rate debt and total debt. The interpretation of these factors is the same as set out above for regressions performed with year dummies.

All REITS (without year dummies, S & P or T-bill)

Findings: The findings for all REITS (without year dummies or S & P index and T-bill factors) indicate that *positive* impacts on returns are: (i) asset growth rate, and (ii) secured debt as a percentage of total debt. Negative impacts were observed for (i) total assets, (ii) total debt, and (iii) increasing share of variable rate debt.

Interpretation: The interpretation of the above findings is the same as set out above for the other scenarios.

All REITS (with S & P index and T-bill rates) by sample ranges.

³³ Graff, Richard A. and Michael S. Young, “Institutional Investor Impact on Equity REIT Performance”, *Real Estate Finance*, Vol. 14, No. 3, Fall 1997, pp. 31-39.

An additional examination was made of several different sample time ranges for all REITS (with S & P index and T-bill rates). This calculation attempts to determine if REITS were generally positively affected by increasing security prices and negatively affected by rising short-term interest rates. As described above, during the entire study period, there was a significant positive impact on REIT returns associated with rising T-bill rates. This phenomenon was more dramatically illustrated when the sample range is reduced to 1993 to 1999 (i.e. the modern REIT era). The following regression outputs are observed:

Dependent Variable: Weighted Average Cost of Capital (WACC) (ex poste)
Method: Pooled Least Squares
Date: 07/21/00 Time: 00:18
Sample: 1993 1999
Included observations: 7
Number of cross-sections used: 137
Total panel (unbalanced) observations: 539
Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-39.38364	8.673966	-4.540443	0.0000
Retail Focus	-0.932830	1.614661	-0.577725	0.5637
Office Focus	-2.018836	1.836706	-1.099161	0.2722
Residential Focus	-3.015892	1.731302	-1.741979	0.0821
Industrial Focus	-0.424003	2.030243	-0.208843	0.8347
Total Assets	-0.101405	0.035142	-2.885568	0.0041
Asset Growth	0.056242	0.006800	8.270538	0.0000
Total Debt + Preferred/Total Assets	-0.167862	0.033816	-4.963955	0.0000
Secured Debt/Total Debt	0.031347	0.017213	1.821077	0.0692
Credit Line Available/Total Assets	-0.069539	0.054960	-1.265262	0.2063
Total Preferred/Total Assets	0.120319	0.070865	1.697845	0.0901
Dividend Payout Ratio (dividend/FFO)	-0.011451	0.010324	-1.109217	0.2678
Debt<1 Year Maturity/Total Debt	0.008436	0.038302	0.220256	0.8258
Debt>5 Year Maturity/Total Debt	0.046667	0.025296	1.844855	0.0656
Variable Rate Debt/Total Debt	-0.071064	0.030213	-2.352068	0.0190
S&P 500 Index	-0.436290	0.105848	-4.121868	0.0000
90 Day T-bill rate	13.56897	2.084796	6.508537	0.0000
R-squared	0.275842	Mean dependent var	10.43982	
Adjusted R-squared	0.253646	S.D. dependent var	13.46973	
S.E. of regression	11.63674	Sum squared resid	70686.01	
F-statistic	12.42733	Durbin-Watson stat	2.191351	
Prob(F-statistic)	0.000000			

Findings: The above sample range reflects a very significant *negative* impact on returns associated with increases in the broad index for securities markets. A *positive* impact of increasing treasure bill rates is also present.

Interpretation: The above findings represent a distinct excursion from the normal expected relationship of securities to the general market. It would seem that the explanation is grounded in the fact that, although REITS are securities in a legal sense, their returns are driven by how REITS capture the underlying fundamentals for the real estate markets. During the period from 1993 to 1999, REITS initially earned superior returns, but beginning in late 1997, REITS experienced significant losses in market value. The resulting diminished returns were experienced during a period of extraordinary growth in values of other securities. Essentially, REITS were a sector that was distinctly disfavored by the broader public capital markets. This counter cyclical behavior is reflected in the above regression and is solid proof that REITS are very different from ordinary securities. This difference is currently reflected by REIT shares trading at what most analysts consider to be substantial discounts from the value of the underlying properties on the private market. At the end of 1999, the public markets rendered a very pessimistic valuation on REIT securities.

REITS by property focus

The above analysis is based on regression results for all REITS. Similar regressions were performed on subgroups of REITS that were selected according to property type focus. The groups of independent variables were the same as described in the preceding section for all REITS. Results were consistent with the results for all REITS. There were not as many significant variables for each property type, but the trends were substantially the same. Detailed regression outputs are omitted.

Findings and interpretation. A review of the results for the pools created based on the concentration of investment in particular property types discloses substantial consistency with the results of the analysis of all REITS. In almost every group of variables and scenario of analysis the data imply the same judgment with respect to firm size, growth rate, and debt. In each instance the negative or positive impact of those factors is the same as for all REITS as a group. Though results for each scenario or group, do not uniformly disclose significant impact from identical variables, the trends are consistent.

Potential Bias

The data used to produce the above results have several aspects that may bias the regression outputs. First, it should be noted that the data do not include observations

for firms that were ceased operation for any reason prior to 1999. The limits of available data preclude the consideration of firms that merged, failed or surrendered REIT status. As a result, there may be a survivor bias. Another potential for bias is that the WACC calculation for each year is based on a firm's average weight of debt, preferred and equity during that year. The average is based on the prior year-end values for debt, preferred and equity and the current year-end values for those items. Most independent variables are based on year-end data for the year under consideration and do not involve averaging with the prior years values. Finally, the period of the study excludes all REIT history prior to 1990. This limits the applicability of the findings to the "modern" REIT era with its particular macroeconomic and market characteristics.

Chapter Five: Conclusions

Basic Interpretation

By examining the last 10 years of data reflecting equity REITS returns, it seems clear that the public markets have rendered judgment on a number of matters. In so doing, the markets have determined the value of REITS in a process that takes into account all possible factors. That process is a substantial departure from the classical asset appraisal process even though both are certainly grounded in the fundamental notion of discounting cash flows. The markets determination of value is expressed by its *ex post* expression of rates of return on capital for individual REITS. The returns are impacted positively or negatively depending on the differences among the REITS. After adjusting for macroeconomic variables and for the effects of the general market, it appears that various firm level variables have a significant impact on total returns to capital. Those significant factors fall into the general categories of debt, size, and growth.

Debt. The major factor that impacts returns negatively is a high level of debt. In addition, firms that have shorter duration debt or variable rate debt experience negative impacts. The rather obvious implication of these results is that the market punishes REITS with a leveraged capital structure. Though preferred stock operates like debt,

markets reward higher levels of preferred stock in the capital structure. This indicates that rewards in returns are given for having a more flexible “debt” structure.

Why the penalty for debt? A review of the recent history of REITS discloses that great shareholder value was achieved by acting quickly to take advantage of opportunities in the asset market. Essentially, REITS functioned as “dealers” and provided liquidity in an illiquid market. If that opportunity arose again, REITS with high debt levels would be impaired from maximizing returns. In addition, high debt levels restrict the opportunity for the REIT to repurchase its own shares when to do so would be advantageous. Finally, significant amounts of debt are probably correlated with those REITS that continued high levels of acquisitions after the time to buy had ended. For all of these reasons, REITS with relatively higher debt levels have earned lower returns.

Size. Larger REITS have lower returns. This result is quite likely related to the lower risk of diversification by size. In addition, the behavior of institutional investors will disproportionately impact larger REITS; during the last few years of “depression” in the REIT sector, large firms experience the downside of that relationship.

Growth. The market rewards asset growth. Firms grow by indirect and direct acquisition of assets. Direct acquisitions took place during much of the study period. As indicated in the history section of chapter one, there was a period of extraordinarily successful buying. Those firms that bought the most bargains were rewarded with higher returns. In addition, many firms grew by merger with smaller REITS and the market seems to

have rewarded these firms as well. These rewards may reflect both certain economies of scale and the superior management skills of the acquiring firms.

Implications. REITS may achieve better returns by avoiding debt and growing the asset base. This traditional wisdom is validated by empirical analysis of the historical data for REITS during the decade of the 1990's.

Further Inquiries

As mentioned earlier in this thesis, there are a theoretically unlimited number of firm level variables that might be considered in a search for factors that significantly affect the returns to REITS. A number of major balance sheet factors have been captured and examined in this thesis. There remain several categories of firm level variables that can be subject to analysis. These factors include those generally grouped under the category of "governance", the participation of a REIT in development activity, and the quality of a REITS ability to communicate with investors (primarily the institutional investment community).³⁴ Each of these components differs dramatically at the firm level and doubtlessly affects returns.

Governance. Governance issues with respect to REITS include the matters related to management compensation, conflicts of interest, the independence of boards of

³⁴ The authors are indebted to Mr. Fred Carr of the Penobscot Group for his articulation of these items as reflecting the current consensus among REIT advisors as to qualitative determinates of relative performance.

directors, and features affecting mergers and acquisitions.³⁵ Though one might attempt to define governance and conflict issues in mathematical terms, this thesis does not attempt that undertaking.³⁶ A logical extension of this inquiry would be the addition of governance factors into the groups of variables forming the basis for a regression.

Development. Development activities are an interesting component of the REIT industry. Classical theory states that the REITS are less than ideally suited to develop property. The cash demands of development conflict with the payout requirements to retain REIT status. In addition, the asset holding requirements applicable to REITS preclude them from becoming merchant builders. The entrepreneurial skills essential to development differ greatly from the more custodial expertise appropriate to managing existing assets. Finally, the cyclical nature of development makes it difficult for a REIT to maintain continuity of its development staff over market cycles. Based on these factors one would expect REITS to avoid development activities unless to do so would capture some opportunities. Some research indicates that higher returns do exist for REITS that develop but that risk-adjusted returns are not enhanced.³⁷ Further examination of the relation of development activity to firm level returns is indicated.

³⁵ For an excellent summary of the factors affecting governance see: Sagalyn, Lynne B., "Conflicts of Interest in the Structure of REITS", *Real Estate Finance*, (Summer 1996). Also see: Sirmans, C.F. "Research on Corporate Governance", *Real Estate Finance* (Fall 1997).

³⁶ For such an inquiry, see: Friday, H. Swint, "The control and Pricing of Agency Costs in Real Estate Investment Trusts, Two Essays", Unpublished dissertation, Florida State University, 1997.

³⁷ Brounen, D., P.M.A. Eichholtz, and P.M. Kanters, "The effects of Property Development Activities on the Performance of REITS", *Real Estate Finance*, Winter 2000.

Communications. Information frictions and personal relationships are clearly important to investment analysis and performance. For REITS in particular, those who communicate with the investor relations professionals of the various firms often note the importance of communication quality. Communications with firms take place on a person-to-person basis (e.g. the analyst's phone call to the CFO) and on a broader basis such as press releases and websites. Large investors, in particular, often consider the quality of those communications in determining whether buy or sell a REIT stock. Good communication fosters credibility and poor communication does the opposite. Though a quantification of communication quality is an interesting problem, some sort of inquiry into this factor seems appropriate.

Final Thoughts

REITS are an interesting hybrid of real property assets with the firm level financial and organizational features. As publicly traded securities, equity REITS are judged daily on the value of this collective enterprise. Those judgments consider both macroeconomic factors and firm level factors. Investors often attempt to diversify portfolios to eliminate firm level risk, but a fully diversified market portfolio is probably unattainable. This is particularly true in the relatively small universe of public equity REITS. Thus, firm level factors continue to merit inquiry and consideration by investors and REIT managers.

Data on return to capital for equity REITS from 1990-1999 indicate that negative impacts to returns include: increasing firm size, increasing levels of debt and reduced

debt flexibility. Positive impacts on returns were observed in firms with more rapid growth of assets and more flexible debt structure. During recent years, REITS have performed counter-cyclically with broader markets and continue to represent an inflation hedge.

Investors should consider these factors when they make choices in the structuring of an investment portfolio. Those responsible for managing REITS, if they are listening to the markets, should grow their asset base, reduce their debt, and be prepared to repurchase shares or liquidate assets if the market continues to say there is no current need for a “dealer” network and that real estate is more valuable on Main Street than on Wall Street.

Appendix A: All variables included in the database:

Variable Acronym	Variable Description
wacc	Weighted Total Return (WACC)
pfr	Prop Focus Dummy Variable Retail-1, other-0
pfo	Prop Focus Dummy Variable Office-1, other-0
pfs	Prop Focus Dummy Variable Residential-1, other-0
phi	Prop Focus Dummy Variable Industrial-1, other-0
ta	Total Assets
taad	Total Assets plus Accrued Depreciation
tnp1	Total Non-depreciable Property/Total Asset
tnp2	Total Non-depreciable Property/Total Assets+Accrued Depreciation
ag1	Asset Growth w/o adding back Accrued Depreciation
ag2	Asset Growth adding back Accrued Depreciation
td1	Total Debt w/ Preferred /Total Assets
tdp1	Total Debt w/ Preferred /Total Assets plus Accrued Depreciation
td2	Total Debt w/o Preferred /Total Assets
tdp2	Total Debt w/o Preferred /Total Assets plus Accrued Depreciation
sd	Secured Debt /Total Debt
cla1	Credit Lines Available /Total Assets
cla2	Credit Lines Available /Total Assets plus Accrued Depreciation
tpf1	Total Preferred /Total Assets
tpf2	Total Preferred /Total Assets plus Accrued Depreciation
dpr	Dividend payout ratio (div/FFO)
msd1	Maturity Structure of Debt (S-T) <1yr/TOTAL DEBT
msd5	Maturity Structure of Debt (5+yrs)/TOTAL DEBT
vrd	Variable-rate Debt/TOTAL DEBT
sp	S&P 500
tbill	T-bills
year1991	1991 year dummy
year1992	1992 year dummy
year1993	1993 year dummy
year1994	1994 year dummy
year1995	1995 year dummy
year1996	1996 year dummy
year1997	1997 year dummy
year1998	1998 year dummy
year1999	1999 year dummy

Appendix B: All data points and respective sources.

Data Item	Source Notes
Company Name	SNL DataSource
Ticker	SNL DataSource
Year of IPO	SNL DataSource
Total Debt	SNL DataSource
UPREIT Market Capitalization (common+OP)	SNL DataSource
Preferred Equity	SNL DataSource
Redeemable Preferred	SNL DataSource
Trust Preferred	SNL DataSource
Total Preferred	Thesis Formula
TOTAL CAPITALIZATION (excluding other mezzanine items)	Thesis Formula
Previous Year - Total Debt	SNL DataSource
Previous Year - UPREIT Market Capitalization (common+OP)	SNL DataSource
Previous Year - Preferred Equity	SNL DataSource
Previous Year - Redeemable Preferred	SNL DataSource
Previous Year - Trust Preferred	SNL DataSource
Previous Year - Total Preferred	Thesis Formula
Previous Year - TOTAL CAPITALIZATION (excluding other mezzanine items)	Thesis Formula
Average Total Debt	Thesis Formula
Average Total UPREIT Market Cap (Common+OP)	Thesis Formula
Average Total Preferred	Thesis Formula
Average Total Cap (excluding other mezzanine items)	Thesis Formula
Interest Expense	SNL DataSource
Avg Debt Return	Thesis Formula
Avg Total Debt/ Avg Total Cap	Thesis Formula
Weighted Debt Return	Thesis Formula
Equity Total Return (common+OP)	FactSet Data
Avg UPREIT Market Cap / Average Total Cap (common+OP)	Thesis Formula
Weighted Equity Return (common+OP)	Thesis Formula
Preferred Dividend	SNL DataSource
Avg Preferred Return	Thesis Formula
Avg Total Preferred/Avg Total Cap	Thesis Formula
Weighted Preferred Return	Thesis Formula
Weighted Total Return (WACC)	Thesis Formula

Property Focus	SNL DataSource
Prop Focus Dummy Variable Retail-1, other-0	Thesis Formula
Prop Focus Dummy Variable Office-1, other-0	Thesis Formula
Prop Focus Dummy Variable Residential-1, other-0	Thesis Formula
Prop Focus Dummy Variable Industrial-1, other-0	Thesis Formula
Prop Focus Dummy Variable Other-1, major4-0	Thesis Formula
Total Assets	SNL DataSource
Accumulated Depreciation	SNL DataSource
Total Assets plus Accrued Depreciation	Thesis Formula
Previous Year - Total Assets	SNL DataSource
Previous Year - Accumulated Depreciation	SNL DataSource
Previous Year - Total Assets plus Accrued Depreciation	Thesis Formula
Asset Growth w/o adding back Accrued Depreciation	SNL DataSource
Asset Growth adding back Accrued Depreciation	Thesis Formula
Total Debt	SNL DataSource
Total Preferred	SNL DataSource
Total Debt + Total Preferred	Thesis Formula
Total Debt w/ Preferred /Total Assets	Thesis Formula
Total Debt w/o Preferred /Total Assets	Thesis Formula
Total Debt w/ Preferred /Total Assets plus Accrued Depreciation	Thesis Formula
Total Debt w/o Preferred /Total Assets plus Accrued Depreciation	Thesis Formula
Secured Debt	SNL DataSource
Secured Debt /Total Debt	SNL DataSource
Credit Lines Available - Actual	SNL DataSource
Credit Lines Available /Total Assets	Thesis Formula
Credit Lines Available /Total Assets plus Accrued Depreciation	Thesis Formula
Total Preferred /Total Assets	Thesis Formula
Total Preferred /Total Assets plus Accrued Depreciation	Thesis Formula
Dividend payout ratio (div/FFO)	SNL DataSource
Maturity Structure of Debt (S-T) <1yr	SNL DataSource
Maturity Structure of Debt (5+yrs)	SNL DataSource
Variable-rate Debt	SNL DataSource
Maturity Structure of Debt (S-T) <1yr/TOTAL DEBT	Thesis Formula
Maturity Structure of Debt (5+yrs)/TOTAL DEBT	Thesis Formula
Variable-rate Debt/TOTAL DEBT	Thesis Formula

Appendix C: All REITS within the database.

Company Name	Ticker
Acadia Realty Trust	AKR
Aegis Realty, Inc.	AER
Agree Realty Corporation	ADC
Alexandria Real Estate Equities, Inc.	ARE
AMB Property Corporation	AMB
American Industrial Properties REIT	IND
AmeriVest Properties Inc.	AMV
AMLI Residential Properties Trust	AML
Apartment Investment and Management Company	AIV
Archstone Communities Trust	ASN
Arden Realty Inc.	ARI
Asset Investors Corporation	AIC
Associated Estates Realty Corporation	AEC
AvalonBay Communities Inc.	AVB
Banyan Strategic Realty Trust	BSRTS
Bedford Property Investors, Inc.	BED
BNP Residential Properties, Inc.	BNP
Boston Properties, Inc.	BXP
Bradley Real Estate, Inc.	BTR
Brandywine Realty Trust	BDN
BRE Properties, Inc.	BRE
Burnham Pacific Properties, Inc.	BPP
Cabot Industrial Trust	CTR
Camden Property Trust	CPT
Capital Automotive REIT	CARS
Captec Net Lease Realty, Inc.	CRRR
CarrAmerica Realty Corporation	CRE
CBL & Associates Properties, Inc.	CBL
CenterPoint Properties Trust	CNT
CenterTrust, Inc.	CTA
Charles E. Smith Residential Realty, Inc.	SRW
Chateau Communities, Inc.	CPJ
Chelsea GCA Realty, Inc.	CCG
Colonial Properties Trust	CLP
Commercial Assets Inc.	CAX
Commercial Net Lease Realty, Inc.	NNN

Cornerstone Properties, Inc.	CPP
Cornerstone Realty Income Trust Inc.	TCR
Corporate Office Properties Trust	OFC
Cousins Properties Incorporated	CUZ
Crescent Real Estate Equities Company	CEI
Crown American Realty Trust	CWN
Developers Diversified Realty Corporation	DDR
Duke-Weeks Realty Corporation	DRE
EastGroup Properties, Inc.	EGP
Entertainment Properties Trust	EPR
Equity Office Properties Trust	EOP
Equity One, Inc.	EQY
Equity Residential Properties Trust	EQR
Essex Property Trust, Inc.	ESS
Federal Realty Investment Trust	FRT
First Industrial Realty Trust, Inc.	FR
First Union Real Estate Equity and Mortgage Invts.	FUR
First Washington Realty Trust, Inc.	FRW
Franchise Finance Corporation of America	FFA
Gables Residential Trust	GBP
General Growth Properties, Inc.	GGP
Glenborough Realty Trust Incorporated	GLB
Glimcher Realty Trust	GRT
Golf Trust of America, Inc.	GTA
Great Lakes REIT, Inc.	GL
Grove Property Trust	GVE
Highwoods Properties, Inc.	HIW
HMG/Courtland Properties, Inc.	HMG
Home Properties of New York, Inc.	HME
Horizon Group Properties, Inc.	HGPI
HRPT Properties Trust	HRP
Income Opportunity Realty Investors, Inc.	IOT
Investors Real Estate Trust	IRETS
IRT Property Company	IRT
JDN Realty Corporation	JDN
JP Realty, Inc.	JPR
Keystone Property Trust	KTR
Kilroy Realty Corporation	KRC

Kimco Realty Corporation	KIM
Koger Equity, Inc.	KE
Konover Property Trust, Inc.	KPT
Kranzco Realty Trust	KRT
Lexington Corporate Properties Trust	LXP
Liberty Property Trust	LRY
Macerich Company	MAC
Mack-Cali Realty Corporation	CLI
Malan Realty Investors, Inc.	MAL
Manufactured Home Communities, Inc.	MHC
Maxus Realty Trust, Inc.	MRTI
MGI Properties	MGI
Mid-America Apartment Communities, Inc.	MAA
Mid-Atlantic Realty Trust	MRR
Mills Corporation	MLS
Mission West Properties, Inc	MSW
Monmouth Real Estate Investment Corporation	MNRTA
National Golf Properties, Inc.	TEE
New Plan Excel Realty Trust	NXL
One Liberty Properties, Inc.	OLP
Pacific Gulf Properties, Inc.	PAG
Pan Pacific Retail Properties, Inc.	PNP
Parkway Properties, Inc.	PKY
Pennsylvania Real Estate Investment Trust	PEI
Philips International Realty Corporation	PHR
PMC Commercial Trust	PCC
Post Properties, Inc.	PPS
Prentiss Properties Trust	PP
Price Enterprises, Inc.	PREN
Prime Group Realty Trust	PGE
Prime Retail, Inc.	PRT
ProLogis Trust	PLD
PS Business Parks, Inc.	PSB
Public Storage, Inc.	PSA
Ramco-Gershenson Properties Trust	RPT
Realty Income Corporation	O
Reckson Associates Realty Corporation	RA
Regency Realty Corporation	REG

Roberts Realty Investors Inc.	RPI
Rouse Company	RSE
Saul Centers, Inc.	BFS
Shurgard Storage Centers, Inc.	SHU
Simon Property Group, Inc.	SPG
Sizeler Property Investors, Inc.	SIZ
SL Green Realty Corp.	SLG
Sovran Self Storage, Inc.	SSS
Spieker Properties, Inc.	SPK
Stonehaven Realty Trust	RPP
Storage USA, Inc.	SUS
Summit Properties, Inc.	SMT
Sun Communities, Inc.	SUI
Tanger Factory Outlet Centers, Inc.	SKT
Tarragon Realty Investors, Inc.	TARR
Taubman Centers, Inc.	TCO
Town and Country Trust	TCT
Transcontinental Realty Investors, Inc.	TCI
U.S. Restaurant Properties, Inc.	USV
Uni-Invest (U.S.A.), Ltd.	UNII
United Dominion Realty Trust, Inc.	UDR
United Investors Realty Trust	UIRT
United Mobile Homes, Inc.	UMH
Urban Shopping Centers, Inc.	URB
Urstadt Biddle Properties, Inc.	UBP
USP Real Estate Investment Trust	USPTS
Vornado Realty Trust	VNO
Washington Real Estate Investment Trust	WRE
Weingarten Realty Investors	WRI
Western Properties Trust	WIR
Westfield America, Inc.	WEA

Appendix D: REITS by property focus:

Office REITS:

Company Name	Ticker
Alexandria Real Estate Equities, Inc.	ARE
AmeriVest Properties Inc.	AMV
Arden Realty Inc.	ARI
Bedford Property Investors, Inc.	BED
Boston Properties, Inc.	BXP
Brandywine Realty Trust	BDN
CarrAmerica Realty Corporation	CRE
Cornerstone Properties, Inc.	CPP
Corporate Office Properties Trust	OFC
Crescent Real Estate Equities Company	CEI
Duke-Weeks Realty Corporation	DRE
Equity Office Properties Trust	EOP
Great Lakes REIT, Inc.	GL
Highwoods Properties, Inc.	HIW
HRPT Properties Trust	HRP
Kilroy Realty Corporation	KRC
Koger Equity, Inc.	KE
Mack-Cali Realty Corporation	CLI
Parkway Properties, Inc.	PKY
Prentiss Properties Trust	PP
Prime Group Realty Trust	PGE
SL Green Realty Corp.	SLG
Spieker Properties, Inc.	SPK
Uni-Invest (U.S.A.), Ltd.	UNII

Appendix D:

Residential REITS:

Company Name	Ticker
AMLI Residential Properties Trust	AML
Apartment Investment and Management Company	AIV
Archstone Communities Trust	ASN
Asset Investors Corporation	AIC
Associated Estates Realty Corporation	AEC
AvalonBay Communities Inc.	AVB
BNP Residential Properties, Inc.	BNP
BRE Properties, Inc.	BRE
Camden Property Trust	CPT
Charles E. Smith Residential Realty, Inc.	SRW
Chateau Communities, Inc.	CPJ
Commercial Assets Inc.	CAX
Cornerstone Realty Income Trust Inc.	TCR
Equity Residential Properties Trust	EQR
Essex Property Trust, Inc.	ESS
Gables Residential Trust	GBP
Grove Property Trust	GVE
Home Properties of New York, Inc.	HME
Investors Real Estate Trust	IRETS
Manufactured Home Communities, Inc.	MHC
Mid-America Apartment Communities, Inc.	MAA
Post Properties, Inc.	PPS
Roberts Realty Investors Inc.	RPI
Stonehaven Realty Trust	RPP
Summit Properties, Inc.	SMT
Sun Communities, Inc.	SUI
Tarragon Realty Investors, Inc.	TARR
Town and Country Trust	TCT
United Dominion Realty Trust, Inc.	UDR
United Mobile Homes, Inc.	UMH

Appendix D: Retail REITS:

Company Name	Ticker
Acadia Realty Trust	AKR
Aegis Realty, Inc.	AER
Agree Realty Corporation	ADC
Bradley Real Estate, Inc.	BTR
Burnham Pacific Properties, Inc.	BPP
CBL & Associates Properties, Inc.	CBL
CenterTrust, Inc.	CTA
Chelsea GCA Realty, Inc.	CCG
Commercial Net Lease Realty, Inc.	NNN
Crown American Realty Trust	CWN
Developers Diversified Realty Corporation	DDR
Equity One, Inc.	EQY
Federal Realty Investment Trust	FRT
First Union Real Estate Equity and Mortgage Invt.	FUR
First Washington Realty Trust, Inc.	FRW
General Growth Properties, Inc.	GGP
Glimcher Realty Trust	GRT
Horizon Group Properties, Inc.	HGPI
IRT Property Company	IRT
JDN Realty Corporation	JDN
JP Realty, Inc.	JPR
Kimco Realty Corporation	KIM
Konover Property Trust, Inc.	KPT
Kranzco Realty Trust	KRT
Macerich Company	MAC
Malan Realty Investors, Inc.	MAL
Mid-Atlantic Realty Trust	MRR
Mills Corporation	MLS
New Plan Excel Realty Trust	NXL
One Liberty Properties, Inc.	OLP
Pan Pacific Retail Properties, Inc.	PNP
Philips International Realty Corporation	PHR
Price Enterprises, Inc.	PREN

Appendix D: Retail REITS continued:

Prime Retail, Inc.	PRT
Ramco-Gershenson Properties Trust	RPT
Realty Income Corporation	O
Regency Realty Corporation	REG
Rouse Company	RSE
Saul Centers, Inc.	BFS
Simon Property Group, Inc.	SPG
Tanger Factory Outlet Centers, Inc.	SKT
Taubman Centers, Inc.	TCO
United Investors Realty Trust	UIRT
Urban Shopping Centers, Inc.	URB
Urstadt Biddle Properties, Inc	UBP
USP Real Estate Investment Trust	USPTS
Weingarten Realty Investors	WRI
Western Properties Trust	WIR
Westfield America, Inc.	WEA

Appendix D: Industrial REITS:

Company Name	Ticker
AMB Property Corporation	AMB
American Industrial Properties REIT	IND
Cabot Industrial Trust	CTR
CenterPoint Properties Trust	CNT
EastGroup Properties, Inc.	EGP
First Industrial Realty Trust, Inc.	FR
Keystone Property Trust	KTR
Liberty Property Trust	LRY
Maxus Realty Trust, Inc.	MRTI
Mission West Properties, Inc	MSW
Monmouth Real Estate Investment Corporation	MNRTA
Pacific Gulf Properties, Inc.	PAG
ProLogis Trust	PLD
Reckson Associates Realty Corporation	RA

Appendix D: Other REITS:

Company Name	Ticker
Banyan Strategic Realty Trust	BSRTS
Capital Automotive REIT	CARS
Captec Net Lease Realty, Inc.	CRRR
Colonial Properties Trust	CLP
Cousins Properties Incorporated	CUZ
Entertainment Properties Trust	EPR
Franchise Finance Corporation of America	FFA
Glenborough Realty Trust Incorporated	GLB
Golf Trust of America, Inc.	GTA
HMG/Courtland Properties, Inc.	HMG
Income Opportunity Realty Investors, Inc.	IOT
Lexington Corporate Properties Trust	LXP
MGI Properties	MGI
National Golf Properties, Inc.	TEE
Pennsylvania Real Estate Investment Trust	PEI
PMC Commercial Trust	PCC
PS Business Parks, Inc.	PSB
Public Storage, Inc.	PSA
Shurgard Storage Centers, Inc.	SHU
Sizeler Property Investors, Inc.	SIZ
Sovran Self Storage, Inc.	SSS
Storage USA, Inc.	SUS
Transcontinental Realty Investors, Inc.	TCI
U.S. Restaurant Properties, Inc.	USV
Vornado Realty Trust	VNO
Washington Real Estate Investment Trust	WRE

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