Is Value-Added and Opportunisitc Real Estate Investing Beneficial? If So, Why?

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Abstract

There has been a great deal of interest in the question of whether value-added and opportunistic real estate investing has resulted in appropriate risk-adjusted returns. However, a satisfactory answer to this question has not been agreed upon. In this paper, data from the National Council of Real Estate Investment Fiduciaries (NCREIF) property database are examined to bring new evidence to bear on the subject. Using these data, ex post returns are calculated for all sold properties. Then groups are formed based on these returns. A series of discriminant functions are then estimated to relate membership in these groups over time to value-added and opportunistic indicator variables (i.e., risk exposures) and market conditions. Results demonstrate that while value-added and opportunistic private equity real estate investments have higher returns than core investments, their superior returns are driven by beleaguered market conditions as well as by the use of cheap debt.

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1 Introduction

This paper develops evidence that returns on value-added and opportunistic private equity real estate investments are ultimately driven by beleaguered market conditions as well as by the use of cheap debt.[1] These results are certainly not unique to private equity real estate investments. Tests, such as Baker and Wurgler (2007), Chan (2003), Fisher and Statman (2000), and Neal and Wheatley (1998) find that asset classes such as value stocks and small stocks have unusually high returns when the market and investor sentiment are depressed. Sweeney and Warga (1986), Flannery and James (1984), Lynge and Zumwalt (1980) and others find that an interest factor is priced for utility stocks and stocks in the banking and financial services. Bredin et al. (2007), He et al. (2003), Lizieri and Satchell (1997), and McCue and Kling (1994) and others find that REIT stocks are highly sensitive to interest rate risk.[2]

Few empirical studies have directly examined whether conditions of the market or risk are the determinants of the returns on value-added and opportunistic private equity real estate investments. The basic difficulty in testing how value-added and opportunistic private equity real estate investments are priced is the general lack of (transactions-based) returns data.[3]

This paper presents an alternative test of the pricing of value-added and opportunistic

[1] Piazzesi and Schneider (2009) find that recent financial developments may have increased the potential for the use of cheap debt to drive real estate prices. In their model, agents who suffer from inflation illusion see the existence and increased availability of cheap debt as an opportune time to borrow money to invest in real estate, so property prices will climb. Rising property prices, in turn, imply an increase in the contemporaneous return, holding rents constant. In contrast, in periods of high nominal interest rates, agents who suffer from inflation illusion invest in bonds because they see bonds offering high nominal interest rates. However, smart investors subtract high inflation from nominal rates of interest on bonds and realize that real rates of interest are low. These investors borrow from the agents who suffer from inflation illusion, using real estate as collateral, causing property prices to increase. Thus, the Piazzesi and Schneider model is capable of accounting for asset pricing booms when nominal interest rates – and inflation rates – are both high and low.

[2] On the other hand, Mueller and Pauley (1995) find that REIT stocks are insensitive to changes in interest rates.

[3] Geltner (1998), Quan and Quigley (1991), Edelstein and Quan (2006), among others suggest that appraisal smoothing errors engender an underestimation of both the first and second moments for real estate returns. Thus, one must either deal with transactions-based data, or somehow unsmoothed the appraisal-based returns.

private equity real estate investments. The test is based on a property of asset returns that, to our knowledge, has not previously been exploited. This property is that core, value-added, and opportunistic private equity real estate investments are normally underwritten to earn leveraged rates of return of 8 to 12%, 12 to 18%, and 18+%, respectively. Thus, if we were to sort private equity real estate investments into portfolios based on past performance, and evaluate the combination of variables that reliably discriminate between these portfolios, we can conduct a direct test of whether high returns are caused by conditions of the market or the type of investment strategy followed.[4]

Normally, value-added and opportunistic private equity real estate investments involve investments in a wide variety of assets, including residential apartments, office buildings, retail centers, and industrial properties. Generally, these investments are exposed to a high degree of risk, as they typically involve a significant amount of "value creation" through redevelopment or development. In contrast, the investment profile of a core investment is similar to that of a bond, with stable cash flows over long periods of time. For these reasons, the "greater the risk associated with a financial decision, the greater the return expected from it" theory suggests that we should be able to classify each and every property investment into one of the return groups based on the investment style followed and the risks taken on. However, from a characteristics-pricing model perspective (Daniel and Titman (1997), and Daniel et al. (1997)), group membership may also be determined in large part by the conditions of the market and individual property attributes.

To date, the literature has not reached a consensus on the role of characteristics or risk in explaining asset returns. Previous research by Lakonishok, Shleifer, and Vishny (1994),

[4]The test proposed here is a joint test of rationality and asset pricing which embodies a rationality constraint that ex ante expectations (as reflected in typical underwriting criteria) are realized in the long run.

Chan and Lakonishok (2004) among others suggests that the high returns to value and opportunistic investing, at least for stocks, is not attributed to risk adjustments. Instead, this research suggests that cognitive biases underlying investor behavior and the agency costs of professional investment management are the main cause of the high returns to value-added and opportunistic investing.

Within the real estate literature, several researchers have studied whether value-added and opportunistic investment styles ubiquitously generate abnormal returns for real estate investors. For example, using data on real estate mutual funds and using style descriptors created for real estate related securities, Lin and Yung (2004), Gallo, Lockwood and Rutherford (2000), Damodaran and Liu (1993), and Kallberg, Liu and Trzcinka (2000) provide some evidence that value investment strategies provide superior returns for real estate investors. However, using the same data as Lin and Yung (2004) but over a much shorter time period, O'Neal and Page (2000) reach the opposite conclusion.

Why re-investigate the issue of what determines the returns on core, value-added, and opportunistic private equity real estate investments now? First, if the high returns on value-added and opportunistic real estate investments are indeed based on conditions of the market rather than risk, the implications for portfolio analysis and performance evaluation are striking. Value-added and opportunity funds generally sport higher fees to justify the process of searching for high-return investments.[5] Clearly, then, some sort of positive abnormal performance (asset selection skills) is needed to justify investing in real estate funds that specialize in value-added and opportunistic investments rather than core investments.

[5] Value-added and opportunity funds typically have targeted return hurdles above which incentive fees (e.g., 20% of profits) can be earned. Anecdotal evidence suggests that these hurdle rates are set at return levels between 8 and 12%, since this is basically the rate at which core investments are expected to perform. Typically, there is also a high watermark to ensure that underperformance is made up before any performance fee can be charged. Most value-added and opportunity funds will also charge an asset-based management fee that is 1 to 2% of the assets under management.

Second, the empirical literature has not been able, as yet, to provide a satisfying answer to the question, Is there something fundamentally different about core, value-added, and opportunistic real estate investments, or are the higher returns on value-added and opportunistic real estate investments simply due to characteristics or conditions of the market? Plainly, if asymptotic arbitrage is possible, and prices move freely so that real estate markets are always in equilibrium (or moving to it), we would expect property returns to load, on average, only on risk.

Third, the history of value-added and opportunistic investing in the US is essentially a tale of excess capital flows during the mid- to late 1980s and a global real estate crash in the late 1980s and early 1990s (see Conner and Liang (2003)). If these conditions kept real estate markets out of equilibrium during the late 1980s and early 1990s, we would generally expect to find high rates of return on value-added and opportunistic investments. Similarly, as prices of properties in general begin to rise, one should see these abnormally high returns fall.[6]

Our study is in the same vein as the recent work by Peyton (2008), who provides a statistically sound technique for identifying the different return cutoff points that can be used for separating core investments from value-added investment styles, and value-added investments from opportunistic investment styles. However, we differ from Peyton (2008) since we derive and estimate discriminant functions which are used to differentiate properties into the factor group memberships listed above. We also differ from Peyton (2008) in that,

[6]If the cross-sectional variation in expected returns on value-added and opportunistic private equity real estate investments can be explained by beleaguered market conditions as well as by the use of cheap debt, as prices of properties in general begin to rise, one should see these abnormally high returns fall, unless, of course, value-added and opportunistic funds were to begin to operate in riskier markets elsewhere outside of the US where uncertainty is relatively high, or if interest rates were to remain low and value-added and opportunistic funds were to take on more debt. Also, as prices of properties in general begin to rise, we would expect high prices to be bid for core investments, and returns to fall as well producing style-creep and/or style-gaming (where fund managers leave their particular style or take on more debt in order to boost sagging performance). Because of this style-creep or style-gaming on the part of core fund managers, the relative returns on core, value-added, and opportunistic real estate investments could converge, making it difficult to find statistical significance among the average returns on the different funds.

in our model, we measure performance by the internal rate of return rather than the de facto NPI rates of return.

Like us, the aforementioned studies by Lin and Yung (2004), Gallo, Lockwood and Rutherford (2000), Damodaran and Liu (1993), and Kallberg, Liu and Trzcinka (2000) examine whether (or not) value-added and opportunistic investment styles generate high returns for real estate investors. But the focus in these studies is much different. These studies use fund-level data to determine whether (or not) value-added and opportunistic investment styles generate high returns. We use property-level data to test the same hypothesis. This data allows us to judge all properties (or more technically, all sold properties) by their returns on investment and to classify these observations into different factor group membership, which is important in judging whether core, value-added and opportunistic investment styles span the space of realized values of the factor loadings.

Our evidence suggests that much of the high return for value-added and opportunistic investment styles is the result of leverage. However, we also find that market conditions, i.e., business cycle expansion and contraction,and the use of cheap debt can discriminate private equity real estate investments with high returns from those investments with moderate to low returns. This part of the paper is motivated by the fact that there may be better times for investing in value-added and opportunistic private equity real estate investments than others, and that these times are related to beleaguered market conditions i.e., recession periods, and times when debt is cheap compared to the cost of equity.

We also test for and find some evidence of style-creep among core property managers, but not among value-added and opportunistic fund managers. We rationalize these results in terms of manager compensation packages which provide strong incentives for core property

managers to take on more leverage (within limits) in order to achieve a "target" rate of return, especially when property prices are rising and yields are low. In contrast, we generally find that value-added and opportunistic fund managers consistently use a high amount of debt to fund deals regardless of the specific market conditions.

The paper proceeds as follows. Section 2 contains brief background information on value-added and opportunistic private equity real estate investments. In Section 3 we explain the data used in this study. The main task, addressed in Sections 4 and 5, is to compare and evaluate the returns on core, value-added, and opportunistic investments, and determine whether we can classify properties into predetermined groups based on risk characteristics or market conditions. Section 6 concludes the study and offers areas for further research.

2 Value-Added and Opportunistic Funds in Real Estate

The goal of most value-added real estate funds is to achieve a 12 to 18% return. These funds raise money through commitments primarily to blind-pool limited partnerships. These limited partnerships invest in all major property types, plus other retail, hospitality, senior living, and storage. Value-added funds characteristically require significant capital expenditures to allow for rent growth. These capital improvements may include tenant improvements, upgrading facades and signage, and curing deferred maintenance in the areas of roof, parking lot and HVAC systems to improve the property's return and marketability. However, there is generally a lot of uncertainty about future real estate prices, and about the appropriate level of capital expenditure that will maximize the current value of the investment. Thus, in compensation for this high risk, value-added investments will in general generate high returns.

Normally, opportunistic investments are exposed to an even higher degree of risk than

value-added funds, as they typically involve a significant amount of "value creation" through the development (rather than the redevelopment or rehabilitation) of residential, commercial, industrial, and other uses (including speculative development that is for sale or rent) that generate income, which is not known, nor can be known, a priori. Most opportunistic real estate funds are organized in the same manner as value-added funds. These opportunistic funds generally seek to generate an 18+% internal rate of return for the fund and its investment period is typically over a relatively short period of time.

According to Private Equity Real Estate (2009), the 30 largest value-added and opportunistic real estate funds raised more than $20 billion last year (in 2009) and more than $210 billion over the past five years. Among these funds, the five largest – The Blackstone Group, Morgan Stanley Real Estate Investing, Goldman Sachs Real Estate Principal Investment Area, Colony Capital, and Beacon Capital Partners, – raised more than $80 billion over the past five years (accounting for almost 40% of the total capital raised). Overall, The Blackstone Group and Morgan Stanley Real Estate Investing were the most active when measured by value of a fund's sales. The two funds transacted in more than $147 billion of property sales between 2004 and 2009. Further, when measured by the number of transactions, The Blackstone Group was again the most active, buying and selling 1,892 properties between 2004 and 2009. Altogether, the largest number of transactions over this period were for office and retail properties. They accounted for more than 52% of all transactions by the 30 largest real estate funds over this period (Real Estate Analytics (2009)).

Most opportunistic real estate funds will typically employ high leverage, with loan-to-value ratios in excess of 65%. In contrast, value-added funds tend to use higher leverage ratios than core property funds, but lower than opportunistic funds. For example, the loan-to-value ratio

for value-added real estate funds is typically between 50 and 65%. Clearly, the use of high leverage is a reason why value-added and opportunistic investments should earn high returns, but is it the only reason? Obviously, value-added and opportunistic investments are also exposed to a variety of risk characteristics such as exposure to development and significant leasing risk. It has been suggested by Fama (1991), Fama and French (1993, 1996), and Davis, Fama, and French (2000), among others that the higher returns on value-added and opportunistic funds are simply compensation for higher systematic risk, at least for stocks.

The vast majority of investors today appear to have actual allocations to real estate, private equity, and hedge funds in excess of target allocations, mainly as a result of a shrinking total asset base stemming from large stock losses. For example, according to Kingsley Associates (2009), actual allocations to real estate are 56 basis points above target allocations, levels not seen since 2002. Obviously, as a result, most investors are not too interested in allocating new capital flows to real estate. However, of the new capital that was allocated to real estate in 2009, most of this capital was earmarked to value-added and opportunistic funds. A "windows-of-opportunity" hypothesis would explain this behavior as follows. In abstract terms, suppose that sellers are distressed. Further suppose that buyers are distressed as well. Under these difficult market conditions, assets are generally sold to industry outsiders or non-traditional real estate investors including hedge funds. But industry outsiders face significant costs of acquiring the assets. In addition, these investors generally fear overpaying for the assets because they cannot value the asset properly. As a result, asset prices fall well below value in best use. If this model is correct, then in the study of value-added and opportunistic real estate funds, there literally may be windows of opportunity in which real estate markets are not integrated, and in which value-added and opportunistic investments

may lead to higher returns.

3 The Sample

We gathered a sample of core, value-added, and opportunistic real estate investments in order to make the proposed comparison between the returns on value-added and opportunistic investments and the returns on core properties. To be classified as a core property, the property must be fully operational and fully let, or close to fully let, generally involving little capital expenditure after purchase, and have a loan-to-value ratio between zero and 50%. To be classified as a value-added property, the property must be characterized by active management and substantial value-added expansion or conversion; the latter generally involving a significant enhancement (greater than 10% of market value) or a change in use of the property from lower use to a higher and better use (e.g., the conversion of industrial properties into office, or the conversion of rental apartments into condominiums, etc.). In addition, value-added properties must have a loan-to-value ratio between 50 and 65%. To be classified as an opportunistic investment, the property must be a new development opportunity or pre-development property, or a more speculative investment requiring an initial leasing program to attract new tenants. In addition, opportunistic investments must have a loan-to-value ratio in excess of 65%. We used the NCREIF (National Council of Real Estate Investment Fiduciaries) database for sampling core, value-added, and opportunistic real estate investments. The data start in the fourth quarter 1978 with quarterly updates over time.

We first summarize some basic facts about the NCREIF sample. In this part of the analysis, the total number of properties includes both sold and unsold properties, and properties both included and excluded from the NPI (NCREIF Property Index).[7] Table 1 shows the

[7] In the selection of properties to be included in the NPI, properties must meet three major requirements:

number of properties in the NCREIF database during the first quarter of each year from 1979 through 2009 and breaks down the number of properties by core, value-added, and opportunistic investments. This breakdown is also shown in Figure 1. In 1979, the entire NCREIF database consisted of core properties. Over the subsequent 32 years, the total number of properties in the NCREIF database increased more than thirtyfold: 260 properties in 1979 to 8,290 properties in 2009. At the same time, the number of value-added and opportunistic investments have increased to 2,680 and 848 properties in 2009, respectively (which represents about 32% and 10% of the total number of properties, respectively).

– Insert Table 1 Here –

– Insert Figure 1 Here –

Interestingly, there is a large decrease in the number of properties in the NCREIF database beginning in 2008. The total number of properties decreases 14% from 9,278 in 2007 to 8,014 in 2008. This reduction is due to a reporting change relating to a large publicly-traded REIT that was dropped from the NPI because it was no longer providing fair market value accounting values on the properties held in its portfolio.

Table 2 examines the total number of properties by investment style and property type. In the early part of the sample, industrial and office properties represented the largest faction of core property investments: 56 and 25%, respectively, in 1982. Over time, however, the percentage in industrial decreased considerably, only to increase again by 2007. During the

the property must be classified as either office, retail, industrial, apartment, or hotel; the accounting of the property must be performed using market value accounting; and the property must be an operating property, meaning the property must have reached 60% occupancy or has been available for occupancy for a year from its certificate of occupancy. In dealing with core, value-added, and opportunistic investments, then, we obviously do not want to limit ourselves in this study to only those properties that are included in the NPI. Rather, we have decided to be as inclusive as possible for all property types and investment styles. This inclusiveness gives us the maximum number of properties to examine, overcoming the tendency of the NPI to be a core property index, including properties that do not qualify for inclusion in the NPI.

same period, there is a significant increase (in percentage terms) in office properties, bringing office to 40% of the core property investments in 2000. By 2009, however, the percentage in office properties fell to 25%. For value-added investments, the leading property types in the early part of the sample were retail, industrial, and office in the order named, followed by apartments and some hotels. Over time, however, apartments grew in importance – increasing from 15% in 1990 to 27% in 2009 – while retail decreased in importance – decreasing from 32% in 1990 to 16% in 2009. For opportunistic investments, the leading property types in 2001 (which is about when opportunistic investments enter the NCREIF database) were land, office, and retail in the order named, followed by apartments. Over time, the percentage in land has remained fairly stable, while the percentage in retail has decreased – decreasing from 16% in 2001 to 6% in 2009 – and the percentage in apartments grew – increasing from 8% in 2001 to 21% in 2009. In theory, these property type differences should lead to return differences between the investment styles. The discriminant analysis below analyzes this hypothesis.

– Insert Table 2 Here –

Table 3 displays similar data by investment style for four geographic regions: East, Mid-West, South, and West. Note that from a diversification standpoint, one might expect there to be a regional bias to value-added and opportunistic investments. For example, one might suppose that value-added and opportunistic fund managers are not as averse to deviate from a geographically-diverse portfolio as core fund managers and therefore are more likely to pursue local strategies. Further, a value-added and opportunistic fund manager who is free to take on greater risk through greater reliance on renovation or development, or through a number of other factors may also be free to focus attention on fewer holdings and trade in

and out of properties easily.[8] Still further, one might expect the pursuit of higher returns to cause value-added and opportunistic fund managers to invest in many of the same distressed markets. Of course, on the other hand, clients of value-added and opportunistic funds may hold a diversified set of funds. Hence, while the funds themselves may tend to be localized in a limited number of markets, the clients may be in the aggregate diversified. We find the following percent holdings in the aggregate for core investments over time: 30-35% in the West, 20-30% in the South, 15-30% in the Mid-West, and 15-25% in the East. At the same time, the percent holdings for value-added funds in the aggregate are 30-35% in the West, 20-35% in the South, 15-25% in the Mid-West, and 20-25% in the East. Finally, the percent holdings for opportunistic funds in the aggregate are about 25-35% in the South, 25-30% in the West, 25-20% in the East, and 15-20% in the Mid-West. These results do not support a greater-bias-in-local-properties hypothesis in the aggregate.

– Insert Table 3 Here –

We noted earlier that the use of leverage is quite limited on core properties; however, the use of leverage increases on value-added and opportunistic properties. Figure 2 shows the total number of levered and unlevered properties in the NCREIF database over time. In the first quarter of 1983, roughly eight out of every nine properties was 100% equity financed; in the first quarter of 2009, this fraction was 44%. Below, we test two hypotheses to explain this greater use of leverage. The window-of-opportunity hypothesis assumes that more leverage was used because the cost of debt was relatively low and the cost of equity was relatively high. The style-creep hypothesis assumes that more leverage was used to allow fund managers to

[8] Coval and Moskowitz (1999) find that the average mutual fund manager tends to have a large amount of local bias in their holdings. This evidence offers some support that fund managers invest in places or firms which they have greater knowledge of.

meet their target rate of return.

– Insert Figure 2 Here –

4 The Effects of Investment Style Variables

To identify whether value-added and opportunistic private equity real estate investments outperform core properties, we turn to a discriminant analysis. We use this technique because it fits our objective of selecting variables from theoretically obtained sets that can distinguish among groups of portfolios that are ranked based on performance. For this exercise we classify properties into four predetermined groups according to their realized rates of return. The first group is made up of properties earning a rate of return of 8 to 12%. If expectations are realized, this group of properties should correspond mainly to core properties. The second group is made of properties earning a rate of return of 12 to 18%. This group of properties should be comprised mainly of value-added properties. The third group is composed of properties earning a rate of return of 18+%. This group of properties should match up with opportunistic properties. The fourth, and final, group is a catchall or underperformer category, made up of those properties earning a rate of return of less than 8%. On the average, this group of properties should consist of the very-large-variance properties (value-added and opportunistic properties), which should be farther below expected outcomes, by chance, and fall well short of expectations.

Our basic test is to determine if investment style followed is important in distinguishing among these four property groupings (in which case real estate markets might be efficient). The discriminant function that we estimate takes the form:

$$Z = c_0 + c_1 X_1 + c_2 X_2 + \cdots + c_k X_k = c^{'} X \tag{1}$$

where

Z = a discriminant score
X_i = a discriminating variable
c_i = a discriminant coefficient
c_0 = a constant

The values of c_i's are discriminant coefficients that maximize the distance between the means of the dependent variable. To obtain the values of c, the largest nonzero characteristic root (or eigenvalue), λ, of $E^{-1}H$ is computed,

$$\mid E^{-1}H - \lambda I \mid = 0 \tag{2}$$

where

E = within group sums of products
H = among group sums of products

The elements of c are the coefficients of the linear composite in (2), of which there can be more than one solution. The solution for which λ is largest is the first discriminant function; the second discriminant function is the solution with the next largest λ; and so forth. The elements of c represent the effect of the discriminating variable (net of all other variables) on the ability to discriminate among the property groups.

The dependent variable is a dichotomous dependent variable to separate the properties into four portfolios based on realized performance. Realized performance, r, is appropriately

measured by the internal rate of return on invested capital, since it takes into consideration the timing cash contributions and distributions from the investment and the length of time the investment has been held. Naturally, values of r can only be computed on properties that have been sold on or before the first quarter of 2009. Regrettably, however, this restriction creates a potential sample selection problem because of data loss. Unfortunately, there is little we can do to correct for this sample selection problem.

All data that are collected about each property investment are from the NCREIF database. From these data, the cash flows are calculated. The cash flows are discounted to find the levered rate of return, r, on invested capital. Just using the unlevered rate of return on invested capital would be unwise, since leverage is systematically higher on value-added and opportunistic investments than on core properties. Thus, leverage is a potentially important confounding factor.

Unfortunately, debt service payments are not available for the property investments in the NCREIF database. We therefore approximate debt service payments for each property investment using the debt ratios from the NCREIF database and the mortgage constants by property type and date of acquisition from ACLI (American Council of Life Insurers). For quarter t, we define the cash flow as $CF_t = NOI_t - MC_t \times D_{t-1}$, where NOI_t is net operating income on the property at time t, MC_t is the appropriate mortgage constant at time t, and D_{t-1} is the appropriate debt amount at time $t-1$. We obtain terminal values by calculating an equity reversion in the actual terminal year, n, as the difference between the resale value, P_n, and the debt amount, D_n, at time n. Finally, we use the equation $E = \sum_{t=1}^{n}(CF_t - MC_t \times D_{t-1})/(1+r)^t + (P_n - D_n)/(1+r)^n$ to obtain the levered rate of return, r, where $E = P_0 - D_0$ and P_0 is the the property price at time 0.

In computing r, we do not discriminate between properties sales from one NCREIF member-institution to another, or from one NCREIF member-institution to a non-member institution. In the former, the property leaves the database and then is added by a second owner. In the latter, the property leaves the database altogether. Interestingly, property sales between NCREIF member institutions are accompanied by the taking on of more debt. We compute values of r for all property types in the NCREIF database, including all development properties.

Table 4 summarizes the internal rate of return calculations for the four major property types: apartments, industrial, office, and retail. The sample size is reported in parenthesis. The mean (levered) returns on core properties range from a low of 9.5% on office buildings to a high of 11.0% on apartments. The value-added (levered) returns range from a low of 11.4% on retail to a high of 15.6%on office buildings. The opportunistic (levered) returns range from a low of 14.5% on apartments to a high of 16.9% on industrial. These are the data on which our discriminant analysis is based. These returns compare favorably with the earlier returns from Ciochetti and Fisher (2002) and those of Goetzmann and Fisher (2005). Ciochetti and Fisher (2002) compute an unlevered internal rate of return for NCREIF properties from 1980 to 2001 of 8.75%. In contrast, Goetzmann and Fisher (2005) compute a time-weighted unlevered internal rate of return from 1978 to 2004 of 9.4%.

– Insert Table 4 Here –

The key independent variables used in (1) are core, value-added, and opportunistic style variables property type, and region, described below. CORE is a 0-1 binary variable taking the value of one if the property is generally fully operational and fully let, or close to fully let. We also require the use of leverage to be modest, between zero and 50%. Otherwise, the

variable CORE takes on the value of zero.

VALUE-ADDED is a 0-1 binary variable taking the value of one if the property is characterized by active management and substantial value-added conversion; the latter generally involving a significant enhancement to allow for rent growth or a change in use of the property from lower use to a higher and better use (e.g., the conversion of industrial properties into office, or the conversion of rental properties into condominiums, etc.). We also require the use of leverage to be between 50 and 65%. Otherwise, the variable VALUE-ADDED takes on the value of zero.

OPPORTUNISTIC is a 0-1 binary variable taking the value of one if the property is a development property or if the property is a more speculative investment requiring an initial leasing program to attract new tenants. We also test a series of property type 0-1 binary variables to control for illiquidity costs and asset redeployability. Williamson (1988) stresses that asset redeployability (i.e., the physical ease at which the asset can be reconfigured for a different user from a different industry) is a key determinant of liquidation value and debt capacity. We note that reconfiguring certain types of real estate assets for a different user is easier than reconfiguring other types of real estate assets. For example, industrial space is relatively inexpensive to reconfigure for a different user since it is often simply a big open structure that was used as a warehouse or distribution center. On the other hand, high-rise office space can be quite expensive to reconfigure owing to finish levels and physical floor configurations. Similarly, retail shopping structures, hotels and apartment buildings are not easily redeployable, since they have their own unique design features tailoring them for the intended use. The final independent variables in (1) are a series of regional 0-1 binary variables to control for the financial, geographical and social-economic factor uncertainty

within a region. We examine here whether value-added and opportunistic investments exhibit superior performance relative to core properties.

Table 5 shows the results. Core investment style is the left-out category in the analysis of our sample; although, we will have something to say about core fund managers in the next section. The results in Table 5 suggest that property type (apartment, office, retail, etc.) is an important factor which tends to distinguish those properties earning a low return from those properties earning a high return. Specifically, the most important discriminating property types are retail, apartments, and industrial, then comes office and hotels. The coefficients for these variables (see first discriminant function) are all positive, indicating that risk characteristics are important in classifying properties in one group versus another.

The first discriminant function in Table 5 explains 65% of the total dispersion. The second discriminant function explains 31% of total dispersion. The second discriminant function indicates that geographic areas (West and East) are also important in classifying properties with high returns from those with low low returns.

– Insert Table 5 Here –

Normally, where discrimination between properties with high and low returns is more likely to occur is on riskier property types in riskier markets. To test this hypothesis, a series of interaction variables were created, corresponding to property type and geographic region. Results are presented in Table 6. The coefficients on the interaction variables Off.West, Off.East, Ret.West, Ret.MW, Ret.East, Apt.West, and Hot.East are all positive (in the second discriminant function), confirming that there is a tradeoff between risk and return. To a much lesser extent, Apt.East and Hot.West are also important. Unimportant discriminating factors

appear to include Hot.MW and Apt.MW.

– Insert Table 6 Here –

On the basis of these findings it seems reasonable to question whether value-added and opportunistic investments have any discriminatory power in explaining cross-sectional property returns. The results in Table 7 have the four return portfolios as our dependent variable. The control variables included as independent variables in the model are the same as those included in Table 6, with the following exception. We also include the 0-1 variables VALUE-ADDED and OPPORTUNISTIC. We remain agnostic on the question of whether investment style has any discriminatory power in differentiating the four property groupings.

– Insert Table 7 Here –

Two interesting tendencies are apparent in Table 7. First, both VALUE-ADDED and OPPORTUNISTIC are dominant variables in the first discriminant function (explaining 71% of total dispersion). Second, it appears that property type and geographic region are the dominant variables in the second discriminant function (explaining 26% of total dispersion), and that the interaction variables are dominant in the third discriminant function (explaining 4% of total dispersion). In light of our findings so far, it is notable that property type does not appear in the first discriminant function as a significant discriminatory variable.

5 The Effects of Market Conditions or Characteristics

Why have the rates of return on value-added and opportunistic private equity real estate investments been significantly higher than the rate of return on core properties? One intuitive answer is that value-added and opportunistic private equity real estate investments are

"riskier" than core properties and investors require a premium for bearing this additional risk.[9]

But it may also be the case that the high returns on value-added and opportunistic private equity real estate investments are caused by market conditions or characteristics rather than risk exposure. In taking this approach to explain how stocks are priced, Daniel and Titman (1999) show that firms with high market-to-book ratios produce enhanced momentum profits. Daniel and Titman also find that momentum effects are stronger for growth stocks than value stocks. Daniel et al. (1988) assume that these price movements are the result of overreaction to private information and underreaction to public information. Chan (2003) finds that the market underreacts to explicit (firm-specific) news that is publicly released, yet overreacts to implicit news. Baker and Wurgler (2007), Brown and Cliff (2005), Fisher and Statman (2000), and Neal and Wheatley (1998) find that when beginning-of-period proxies for sentiment are low, subsequent returns are relatively high for small stocks, young stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, extreme growth stocks, and distressed stocks.

Specifically, this study empirically investigates whether there are better times for investing in value-added and opportunistic private equity real estate investments than others, and whether these specific times are when market conditions are beleaguered and debt is cheap compared to the cost of equity. Generally, the finance literature suggests that risk premia strongly fluctuate over the business cycle. If, as is perhaps reasonable to suppose, preferences exhibit decreasing risk aversion, then investors should require higher (lower) expected returns

[9] See Merton (1973), Breeden (1979), and Cox, Ingersoll and Ross (1985) for a general equilibrium argument to this effect. A very similar argument is made in Ross (1976), Chamberlain (1983), and Chamberlain and Rothschild (1983) in which returns can be explained by their sensitivities to underlying sources of risk, but which is motivated by absence of arbitrage opportunities.

in recessions (expansions) in order to put an amount of wealth at risk (Fama and French (1989)). On the other hand, the procyclical fluctuation in returns could relate to sentiment levels rather than fundamentals, and because we now have many more sellers than buyers in most real estate markets any price being achieved is a distressed price. During times like now these distressed prices should lead to high returns on value-added and opportunistic private equity real estate investments.

This study also focuses particularly on whether the use of cheap debt accounts for the reason why value-added and opportunistic real estate investments outperform core properties (in a similar spirit to Bhandari's (1988) leverage effect). A combination of lenient lending policies and low interest rates can lead to aggressive risk taking behavior, driven, in part, by excessive compensation schemes that pay bonuses from revenues, not from co-investment profits (Diamond and Rajan (2009), Bebchuk and Spamann (2009)), or to money illusion and greater borrowing (Piazzesi and Schneider (2009)), or to a window of opportunity during which debt is cheap compared to the cost of equity and the strategic use of debt will produce high returns, after controlling for business cycle effects.

To address these questions we look at whether market conditions and the use of cheap debt (in which case real estate markets may not be perfectly efficient and economic agents may not be perfectly rational) can discriminate private equity real estate investments with high returns from those investments with moderate to low returns. To test the business cycle hypothesis – that there are better times for investing in value-added and opportunistic private equity real estate investments than others – we form a time series variable, denoted RECESSION, that is set equal to one during recessions and zero otherwise. The business cycle expansion and contraction dates are from the National Bureau of Economic Research. For more details, see

http://www.nber.com/cycles/cyclesmain.html.

Leverage on each property, denoted LEVERAGE, is measured by the ratio of (book value) debt to the market value of the property. It is natural to ask whether the introduction of a factor related to leverage would be able eliminate the impact of investment style on returns, and whether the greater use of debt was driven, in part, by style-creep or style-gaming and excessive compensation schemes. It is also natural to ask whether the Greenspan era really was a time of cheap debt, and whether the effects of leverage on private equity real estate returns show up only because there is something special about this time period. To test these questions, a series of interaction variables were created so that separate estimates of the effects of leverage on returns could be obtained for the Greenspan era.[10]

Table 8 shows how the apparent relationship between private equity real estate returns and risk characteristics changes as we control for the use of cheap debt. Given the patterns in the returns on core, value-added, and opportunistic private equity real estate investments noted above, it should not be surprising to find that risk factors – property type and investment style – are able to discriminate private equity real estate investments with high returns from those investments with moderate to low returns. The first discriminant function (explaining 80% of the total dispersion) is quite clearly a risk-function-with-a-leverage-effect. The remaining two discriminant function are less easily named, but the geographic variables (explaining 17% of the total dispersion) and the property-type-interaction factors (explaining 2% of the total dispersion) do not appear unreasonable. The coefficient for investment style is larger for opportunistic than value-added. This finding means that if opportunistic style increases, the likelihood that the property will be classified in the highest return group increases the

[10] Viewed in retrospect, we define the Greenspan era of low interest rates as beginning in the first quarter of 2001, as the US economy falls into recession, and then ending in the fourth quarter of 2005, when Ben Bernanke was appointed to succeed Greenspan.

most, while the likelihood that the property will be classified as core or value-added decreases. The coefficient for LEVERAGE indicates that if leverage increases, the probability that the property will be classified in the highest return group increases significantly. This result may reflect several factors. First, an increase in leverage should obviously lead to an increase in return and an increase in asset risk. Second, an increase in leverage can, however, also lead to an increase in return without adding significantly to asset risk if the debt is badly mispriced at the moment.

– Insert Table 8 Here –

Turning to the question of whether debt was mispriced by the market during the Greenspan era in 2001-2005, and whether this mispricing created potential opportunities for value-added and opportunistic funds during this time period, we report in Table 9 the results of interacting leverage and a time series variable for the Greenspan era between 2001 and 2005. First of all, it should be noted that the coefficient estimates in Table 9 are almost identical to the estimated coefficients found in Table 8. As before, these estimated coefficients show that there is a strong tendency for properties with high leverage ratios to have high returns. Regarding the interaction variable, the coefficient is positive and larger than the coefficient on leverage, implying that the use of leverage during the Greenspan era in 2001-2005 greatly affected all property returns to be sure. The findings suggest, among other things, that the use of cheap debt does matter, in fact, it matters a great deal.

– Insert Table 9 Here –

We also find that distressed market conditions are an important discriminating variable, although not as important as financial leverage. LEVERAGE is relatively important to the

first discriminant function, while RECESSION dominates the second discriminant function. See Table 10. We have not seen much work on these effects. However, one might expect that it is really the price paid for the property initially that generates high rates of return in the long-run.

– Insert Table 10 Here –

While investment style is of tremendous practical importance in discriminating between properties with high and low returns in this analysis, controlling for style-creep is also important. We control for this effect by interacting fund manager with a time series variable measuring expansions and with loan-to-value, to determine whether funds increasingly use leverage to meet their target returns when property prices are at historically high levels, but yields are low. The results of this test for value-added and opportunistic fund managers are shown in Table 11. The findings suggest that little evidence of style creep exists for value-added and opportunistic fund managers whatsoever. Value-added and opportunistic fund managers typically use a high amount of debt to fund deals at the outset and continue to do so, no matter what price they might have to pay for the property. Interestingly enough, the style creep hypothesis is also supported in the data for core fund managers. The standardized canonical discriminant function coefficient for style creep among core fund managers loaded highly positive on the first variate, showing that, as property values rise and yields fall, and as core fund managers use higher amounts of debt (within limits) to meet their target returns, higher leveraged properties earn higher returns. See Table 12. This finding is not surprising, since all fund managers have a strong incentive to outperform their benchmark in order to keep their business from walking out the door, but also not to wander into different investment

styles in the pursuit of higher returns.[11]

– Insert Table 11 Here –

– Insert Table 12 Here –

6 Conclusions

This paper has documented evidence that value-added and opportunistic private equity real estate investments have higher returns than core investments and tend to be riskier, but their superior returns are driven by beleaguered market conditions as well as by the use of cheap debt. To show this, we take all property investments and rank them by realized returns. Then properties are grouped into portfolios having returns of 8 to 12%, 12 to 18%, and 18+%, respectively. There is also a catchall or underperformer category, made up of those properties earning a rate of return of less than 8%.

If risk exposure is the only driving factor behind these return differentials, then one should be able to discriminate among these property groupings solely on that basis. In order to test this hypothesis, we used discriminant analysis. The analysis produces equations that are used to classify properties into portfolio groups ranked by performance. We then test whether the investment style followed and property type are the most important factors in the first discriminant function separating the portfolio groupings from each other. Generally, we find that risk exposures enter into the discriminant function in a robust, and expected, manner. However, we also find that market conditions and the use of cheap debt can discriminate

[11] The incentive comes from the basic compensation contract given to the fund manager, which creates an incentive to maximize assets under management. However, fund managers who invest on behalf of institutional investors also have an incentive to invest as a prudent man would and to protect themselves from liability under these rules, which substantially limits excessive risk-taking (see Del Guercio (1996), and Gompers and Metrick (1998)).

private equity real estate investments with high returns from those investments with moderate to low returns. We explore these latter questions by looking at whether there are better times for investing in value-added and opportunistic private equity real estate investments than others, namely, when market conditions are beleaguered and debt is cheap compared to the cost of equity. In particular, our data extend over the period 1978 through 2009. We look at whether recessions during this time period – 1980Q1-1980Q3, 1981Q3-1982Q4, 1990Q3-1991Q1, 2001Q1-2001Q4, and 2007Q4-present – are predictive of the high returns on value-added and opportunistic investments and at whether the high returns were due to the existence of cheap debt (compared to the cost of equity) during the time period 2001-2005.

We also find that core property managers have higher returns in expansionary periods due primarily to the use of higher amounts of debt. In contrast, it would appear that value-added and opportunistic fund managers generally use a high amount of debt to fund deals, no matter whether market conditions are beleaguered or expanding. The incentive for core property managers to take on more debt in expansionary periods comes from the basic compensation contract given to them. Because of this contract, core property managers consistently look for ways to achieve a minimum target return. But actually achieving this minimum target return is difficult to do, especially as property prices rise and yields fall. Given this incentive problem, core property managers generally take on more leverage (within limits) during expansionary periods to achieve the desired return.

The results in this paper are interesting for at least two reasons. First, value-added and opportunity funds generally charge higher fees in return for providing a range of "value-added" services. Yet it would appear that the high returns on value-added and opportunistic private equity real estate investments are due to the use of cheap debt. However, leverage is not an

inherent property characteristic, but a financial tool and any property can be made risky by applying high leverage. Second, value-added and opportunistic funds are likely to operate with much leverage going forward. Given this situation, two important question arise, (1) What target returns can be achieved? and (2) What fees can be charged?

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Year	Core	Value-Added	Opportunistic	Total
19791	260			260
19801	331			331
19811	428			428
19821	569			569
19831	779			779
19841	1040	29		1069
19851	1105	32		1137
19861	1279	39		1318
19871	1545	59		1604
19881	1445	76		1521
19891	1576	99		1675
19901	1734	95		1829
19911	2000	96		2096
19921	1991	102		2093
19931	2097	129		2226
19941	1925	123		2048
19951	2122	126		2248
19961	2436	179		2615
19971	2653	244		2899
19981	2402	229		2631
19991	2428	283	2	2711
20001	3405	373	6	3784
20011	3691	381	7	4079
20021	4355	546	72	4973
20031	4665	933	431	6029
20041	5977	1084	388	7449
20051	6246	1387	406	8039
20061	6673	1672	523	8868
20071	6393	2209	676	9278
20081	4733	2448	833	8014
20091	4762	2680	848	8290

Table 1: NCREIF Database. Number of Property Holdings by Investment Style.

Year	Apartment	Industrial	Office	Retail
		Panel A. Core Investments		
19781	9	177	34	38
19791	8	218	50	53
19801	9	268	70	78
19811	11	334	112	107
19821	13	426	191	127
19831	15	507	261	167
19841	17	534	304	176
19851	28	562	330	174
19861	43	635	390	197
19871	53	678	395	205
19881	77	714	415	213
19891	124	778	433	216
19901	161	819	453	274
19911	195	901	495	378
19921	233	913	490	405
19931	314	781	520	449
19941	308	745	460	382
19951	344	757	453	552
19961	461	825	537	587
19971	522	914	602	589
19981	507	713	647	508
19991	526	725	682	469
20001	588	934	1363	482
20011	685	993	1426	550
20021	692	1302	1622	613
20031	670	1536	1632	688
20041	686	2961	1655	539
20051	681	3265	1606	540
20061	783	3489	1655	556
20071	875	3479	1152	671
20081	925	1708	1199	674
20091	828	1727	1092	651

Table 2: Summary Statistics. Number of Property Holdings by Investment Style and Property Type.

Year	East	Mid-West	South	West
		Panel B. Valued-Added Investments		
19831	0	11	1	15
19841	0	13	1	15
19851	0	13	1	18
19861	0	15	4	20
19871	1	24	9	25
19881	2	31	13	29
19891	7	33	18	33
19901	14	29	21	30
19911	17	24	22	30
19921	18	24	25	32
19931	30	28	31	40
19941	28	32	27	36
19951	30	38	22	36
19961	43	45	52	38
19971	50	61	76	56
19981	60	46	66	55
19991	75	44	90	68
20001	106	57	122	78
20011	108	64	130	83
20021	138	107	179	109
20031	215	285	256	126
20041	229	348	269	186
20051	272	492	303	236
20061	366	598	367	252
20071	554	732	459	341
20081	633	748	544	393
20091	678	834	575	398

Table 2: Summary Statistics, Continued. Number of Property Holdings by Investment Style and Property Type.

Year	East	Mid-West	South	West
		Panel C. Opportunistic Investments		
20001	0	0	1	1
20011	0	0	2	1
20021	8	19	10	4
20031	53	104	74	8
20041	59	87	64	9
20051	60	72	60	9
20061	72	96	64	15
20071	118	118	72	30
20081	190	147	95	41
20091	167	157	107	47

Table 2: Summary Statistics, Continued. Number of Property Holdings by Investment Style and Property Type.

Year	East	Mid-West	South	West
		Panel A. Core Investments		
19781	26	67	40	127
19791	52	88	50	141
19801	65	119	69	175
19811	88	149	108	224
19821	124	200	168	270
19831	152	238	240	327
19841	171	250	260	359
19851	189	248	276	392
19861	214	300	332	433
19871	217	290	362	476
19881	251	294	382	518
19891	284	301	402	589
19901	322	355	406	651
19911	387	417	435	761
19921	412	416	438	803
19931	415	378	490	814
19941	378	362	454	731
19951	424	391	557	750
19961	515	437	698	786
19971	574	470	789	820
19981	500	418	721	763
19991	491	418	752	767
20001	672	498	884	1351
20011	780	526	956	1429
20021	923	683	1111	1638
20031	994	716	1150	1805
20041	1121	895	1801	2160
20051	1245	921	1913	2167
20061	1259	921	2059	2434
20071	1271	925	2056	2141
20081	1073	654	1362	1637
20091	1097	641	1372	1652

Table 3: Summary Statistics. Number of Property Holdings by Investment Style and Region.

Year	East	Mid-West	South	West
	Panel B. Valued-Added Investments			
19831	1	12	7	7
19841	2	12	7	8
19851	2	12	8	10
19861	4	12	10	13
19871	7	20	16	16
19881	12	25	17	22
19891	16	28	21	27
19901	20	25	19	31
19911	22	23	21	30
19921	26	21	24	32
19931	33	20	34	42
19941	31	24	30	38
19951	33	22	34	37
19961	36	29	58	56
19971	44	43	71	86
19981	47	30	61	91
19991	57	40	70	116
20001	94	50	102	127
20011	98	58	106	134
20021	134	74	147	191
20031	224	127	263	319
20041	264	145	307	368
20051	321	189	425	452
20061	391	221	510	550
20071	517	294	698	700
20081	552	344	794	757
20091	626	365	867	822

Table 3: Summary Statistics, Continued. Number of Property Holdings by Investment Style and Region.

Year	East	Mid-West	South	West
Panel C. Opportunistic Investments				
20011	2	0	0	5
20021	22	12	19	19
20031	97	51	120	163
20041	92	41	122	133
20051	94	40	137	135
20061	123	48	178	174
20071	167	72	237	200
20081	210	111	289	223
20091	211	122	271	244

Table 3: Summary Statistics, Continued. Number of Property Holdings by Investment Style and Region.

Style	Apartment	Industrial	Office	Retail
Core	0.1104	0.1024	0.0952	0.1098
	(1127)	(2554)	(1841)	(1096)
Value-Added	0.1344	0.1292	0.156	0.114
	(198)	(158)	(210)	(98)
Opportunistic	0.1452	0.1642	0.1596	–
	(21)	(48)	(24)	

Table 4: Summary Statistics. Mean IRR Values by Property Type.

	Function		
Variable	1	2	3
Apartment	3.72	2.05	0.91
Office	2.94	-0.24	-0.61
Retail	4.09	1.39	-1.63
Industrial	3.66	0.52	-1.19
Hotel	1.72	-1.25	2.21
West	-0.92	1.26	-0.06
South	0	0	0
MW	0.87	-0.03	0.61
East	-0.57	1.18	-0.99
Disc Crit.	0.65*	0.31*	0.04

Table 5: Discriminant Criteria and Canonical Coefficients for Three Discriminant Functions, Property Type and Location. Discriminant equations are estimated using levered IRR on assets sold from the period 1978 to 2009. * indicates significant at the 0.05 level on the basis of the chi-square approximation.

	Function		
Variable	1	2	3
Apartment	4.04	2.13	0.64
Office	2.87	-0.39	-0.99
Retail	3.79	1.24	-1.77
Industrial	3.37	0.86	-1.01
Hotel	3.67	-0.93	-1.04
West	-0.67	0.68	-0.39
South	0	0	0
MW	1.07	0.21	1.05
East	0.01	0.17	-2.17
Off.West	0.13	0.31	0.82
Off.South	0	0	0
Off.MW	0.08	-0.36	-0.89
Off.East	-0.78	1.95	1.93
Ret.West	0.57	0.64	0.73
Ret.South	0	0	0
Ret.MW	-0.94	0.38	-0.07
Ret.East	-0.20	0.98	1.06
apt.West	-1.67	0.91	-0.98
apt.South	0	0	0
apt.MW	-0.05	-0.44	-2.28
apt.East	-1.09	-0.41	2.20
Hot.West	-2.77	-1.36	3.55
Hot.South	0	0	0
Hot.MW	-2.30	-1.92	-0.62
Hot.East	-3.27	2.08	6.91
Disc Crit.	0.66*	0.29*	0.05

Table 6: Discriminant Criteria and Canonical Coefficients for Three Discriminant Functions, Property Type, Location, and Interaction Variables. Discriminant equations are estimated using levered IRR on assets sold from the period 1978 to 2009. * indicates significant at the 0.05 level on the basis of the chi-square approximation.

	Function		
Variable	1	2	3
Value-Added	1.91	0.26	0.40
Opportunistic	1.14	2.38	0.65
Office	-1.59	2.21	1.80
Retail	-2.45	0.87	2.72
Industrial	-2.44	1.09	1.46
Hotel	-2.21	2.86	1.87
West	0.95	-0.72	0.86
South	0	0	0
East	0.39	-0.03	2.67
Off.West	-0.54	-0.29	-1.26
Off.South	0	0	0
Off.MW	-0.95	0.33	-0.13
Off.East	0.17	-2.06	-2.34
Ret.West	-0.91	-0.52	-1.13
Ret.South	0	0	0
Ret.MW	-0.18	-0.53	-0.97
Ret.East	-0.22	-1.40	-1.47
apt.West	0.82	-1.16	0.49
apt.South	-2.81	0.03	0.31
apt.MW	-0.87	0.41	1.26
apt.East	0.56	0.061	-2.75
Hot.West	2.21	0.71	-4.18
Hot.South	0	0	0
Hot.MW	1.18	1.26	-0.59
Hot.East	2.17	-2.63	-7.47
Disc Crit.	0.71*	0.26*	0.04

Table 7: Discriminant Criteria and Canonical Coefficients for Three Discriminant Functions, Style, Property Type, Location, and Interaction Variables. Discriminant equations are estimated using levered IRR on assets sold from the period 1978 to 2009. * indicates significant at the 0.05 level on the basis of the chi-square approximation.

	Function		
Variable	1	2	3
Value-Added	0.19	0.10	-0.44
Opportunistic	0.87	-2.23	-0.63
Leverage	2.88	-0.38	0.17
Apartment	-2.56	-0.34	0.07
Office	-1.47	-2.38	-1.40
Retail	-2.28	-1.13	-2.30
Industrial	-1.85	-1.33	-1.51
Hotel	-1.84	-3.10	-1.47
West	0.39	0.78	-0.40
South	0	0	0
MW	-0.59	-0.09	0.99
East	0.05	0.04	-2.17
Off.West	-0.11	0.26	0.80
Off.South	0	0	0
Off.MW	-0.16	-0.33	-0.87
Off.East	0.24	2.11	1.86
Ret.West	-0.36	0.45	0.67
Ret.South	0	0	0
Ret.MW	0.44	0.60	-0.04
Ret.East	0.04	1.05	1.01
apt.West	0.73	1.29	-0.92
apt.South	0	0	0
apt.MW	-0.04	-0.41	-2.22
apt.East	0.62	0.04	2.25
Hot.West	1.75	-0.40	3.64
Hot.South	0	0	0
Hot.MW	1.47	-1.03	-0.42
Hot.East	1.58	2.90	6.89
Disc Crit.	0.80	0.17	0.02

Table 8: Discriminant Criteria and Canonical Coefficients for Three Discriminant Functions, Style, Property Type, Location, Interaction Variables, and Leverage. Discriminant equations are estimated using levered IRR on assets sold from the period 1978 to 2009. * indicates significant at the 0.05 level on the basis of the chi-square approximation.

	Function		
Variable	1	2	3
Value-Added	0.26	-0.12	0.37
Opportunistic	0.59	2.22	0.07
Leverage	1.21	2.72	1.69
Leverage x Greenspan Era	2.85	-3.28	-2.77
Apartment	-1.23	1.65	0.50
Office	-1.80	0.31	1.42
Retail	-1.78	0.64	0.43
Industrial	-1.64	2.19	0.27
Hotel	0.63	-0.46	1.11
West	0	0	0
South	0.24	0.16	2.35
MW	-0.26	-0.41	-1.12
East	0	0	0
Off.West	-0.67	0.10	-0.42
Off.South	0.20	-1.93	-1.39
Off.MW	-0.59	-0.49	-0.88
Off.East	0	0	0
Ret.West	-0.13	-0.47	-0.65
Ret.South	-0.17	-0.92	-0.92
Ret.MW	0.45	-0.85	0.95
Ret.East	-2.04	-0.49	-0.37
apt.West	-0.59	0.29	0.77
apt.South	0.34	-0.01	-2.23
apt.MW	1.54	0.40	-3.53
apt.East	0	0	0
Hot.West	0.76	1.13	-0.70
Hot.South	1.55	-2.50	-5.24
Hot.MW	0.78	0.19	0.03
Hot.East	1.76	1.93	4.89
Disc Crit.	0.76*	0.22*	0.03

Table 9: Discriminant Criteria and Canonical Coefficients for Three Discriminant Functions, Style, Property Type, Location, Interaction Variables, Leverage, and Greenspan Era. Discriminant equations are estimated using levered IRR on assets sold from the period 1978 to 2009. * indicates significant at the 0.05 level on the basis of the chi-square approximation.

	Function		
Variable	1	2	3
Value-Added	0.18	-0.07	-0.42
Opportunistic	0.77	2.13	-0.75
Leverage	2.85	0.53	0.17
Recession	-0.46	1.37	0.32
Apartment	-2.54	0.05	-0.003
Office	-1.47	1.85	-1.60
Retail	-2.25	0.69	-2.41
Industrial	-1.81	0.84	-1.65
Hotel	-1.87	2.48	-1.73
West	0.41	-0.66	-0.33
South	0	0	0
MW	-0.58	0.02	0.96
East	0.05	-0.07	-2.15
Off.West	-0.11	-0.23	0.81
Off.South	0	0	0
Off.MW	-0.15	0.23	-0.90
Off.East	0.27	-1.77	2.01
Ret.West	-0.36	-0.39	0.70
Ret.South	0	0	0
Ret.MW	0.46	-0.51	0.01
Ret.East	0.05	-0.87	1.09
apt.West	0.79	-1.18	-0.83
apt.South	0	0	0
apt.MW	-0.04	0.33	-2.24
apt.East	0.62	0.02	2.24
Hot.West	1.70	0.61	3.62
Hot.South	0	0	0
Hot.NW	1.45	0.98	-0.48
Hot.East	1.61	-2.30	7.06
Disc Crit.	0.77*	0.21*	0.02

Table 10: Discriminant Criteria and Canonical Coefficients for Three Discriminant Functions, Style, Property Type, Location, Interaction Variables, Leverage, and Market Conditions. Discriminant equations are estimated using levered IRR on assets sold from the period 1978 to 2009. * indicates significant at the 0.05 level on the basis of the chi-square approximation.

	Function		
Variable	1	2	3
Value-Added	1.32	-0.22	0.25
Opportunistic	0.97	1.98	-0.31
Leverage	1.29	2.60	1.75
Leverage x Greenspan Era	3.35	-2.86	-3.09
Recession	-0.76	1.17	-0.68
Value-Added x Lev x Exp	-2.69	0.42	0.34
Opportunistic x Lev x Exp	-4.45	1.58	4.26
Office	-1.03	1.20	0.55
Retail	-1.52	-0.11	1.28
Industrial	-1.49	0.16	0.43
Hotel	-1.46	1.66	0.39
West	0.61	-0.36	0.98
South	0	0	0
East	0.25	0.13	2.23
Off.West	-0.20	-0.40	-1.10
Off.South	0	0	0
Off.MW	-0.60	-0.04	-0.37
Off.East	0.23	-1.68	-1.52
Ret.West	-0.52	-0.49	-0.88
Ret.South	0	0	0
Ret.MW	-0.12	-0.47	-0.64
Ret.East	-0.19	-0.81	-0.97
apt.West	0.47	-0.81	0.89
apt.South	-1.73	-0.79	-0.55
apt.MW	-0.56	0.15	0.79
apt.East	0.30	0.06	-2.10
Hot.West	1.52	0.62	-3.43
Hot.South	0	0	0
Hot.MW	0.95	1.01	-0.71
Hot.East	1.46	-1.96	-5.22
Disc Crit.	0.77	0.20	0.03

Table 11: Discriminant Criteria and Canonical Coefficients for Three Discriminant Functions, Test of Style Creep Among Value-Added and Opportunistic Fund Managers. Discriminant equations are estimated using levered IRR on assets sold from the period 1978 to 2009. * indicates significant at the 0.05 level on the basis of the chi-square approximation.

	Function		
Variable	1	2	3
Value-Added	1.58	-0.33	0.80
Opportunistic	0.80	2.11	0.06
Leverage	-1.62	3.17	-4.06
Leverage x Greenspan Era	3.54	-2.88	3.20
Recession	-0.32	1.09	0.96
Core x Lev x Exp	3.19	-0.63	2.70
Office	-1.09	1.24	-0.55
Retail	-1.52	-0.08	-1.19
Industrial	-1.54	0.20	-0.40
Hotel	-1.44	1.69	-0.31
West	0.61	-0.36	-1.01
South	0	0	0
East	0.24	0.14	-2.19
Off.West	-0.20	-0.40	1.10
Off.South	0	0	0
Off.MW	-0.56	-0.05	0.41
Off.East	0.25	-1.69	1.48
Ret.West	-0.55	-0.49	0.90
Ret.South	0	0	0
Ret.MW	-0.09	-0.47	0.62
Ret.East	-0.19	-0.81	0.92
apt.West	0.52	-0.82	-0.85
apt.South	-1.77	-0.75	0.55
apt.MW	-0.54	0.14	-0.71
apt.East	0.31	0.053	2.02
Hot.West	1.48	0.64	3.25
Hot.South	0	0	0
Hot.MW	0.84	1.06	0.58
Hot.East	1.41	-1.96	4.93
Disc Crit.	0.77	0.20	0.03

Table 12: Discriminant Criteria and Canonical Coefficients for Three Discriminant Functions, Test of Style Creep Among Core Fund Managers. Discriminant equations are estimated using levered IRR on assets sold from the period 1978 to 2009. * indicates significant at the 0.05 level on the basis of the chi-square approximation.

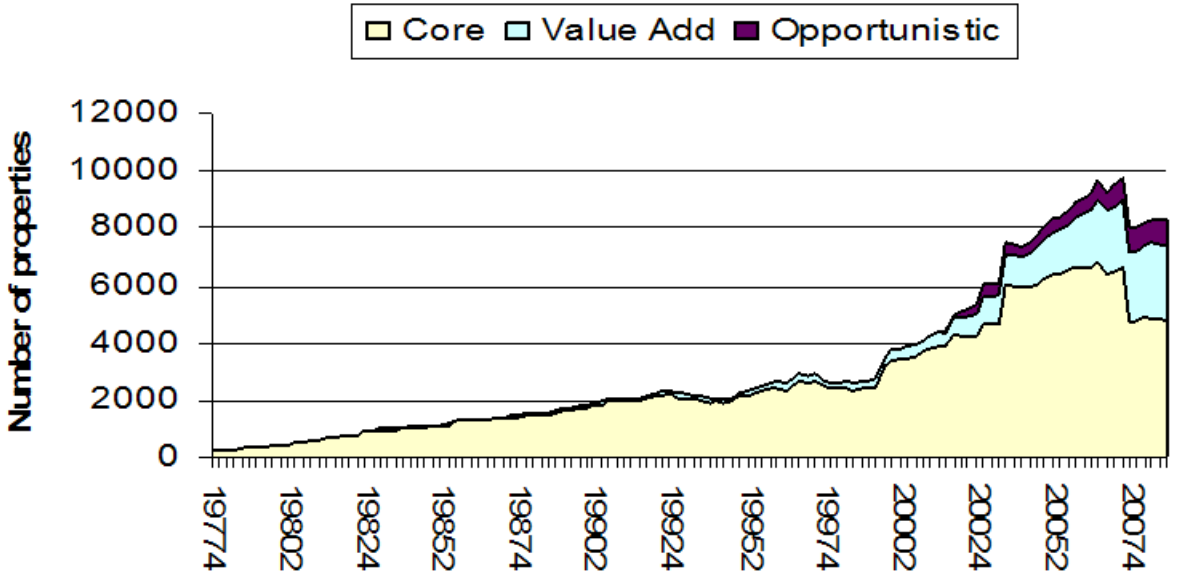

Figure 1: Number of Core, Value-Added, and Opportunistic Properties. Vertical axis: Property count. Horizontal axis: Time in quarter.

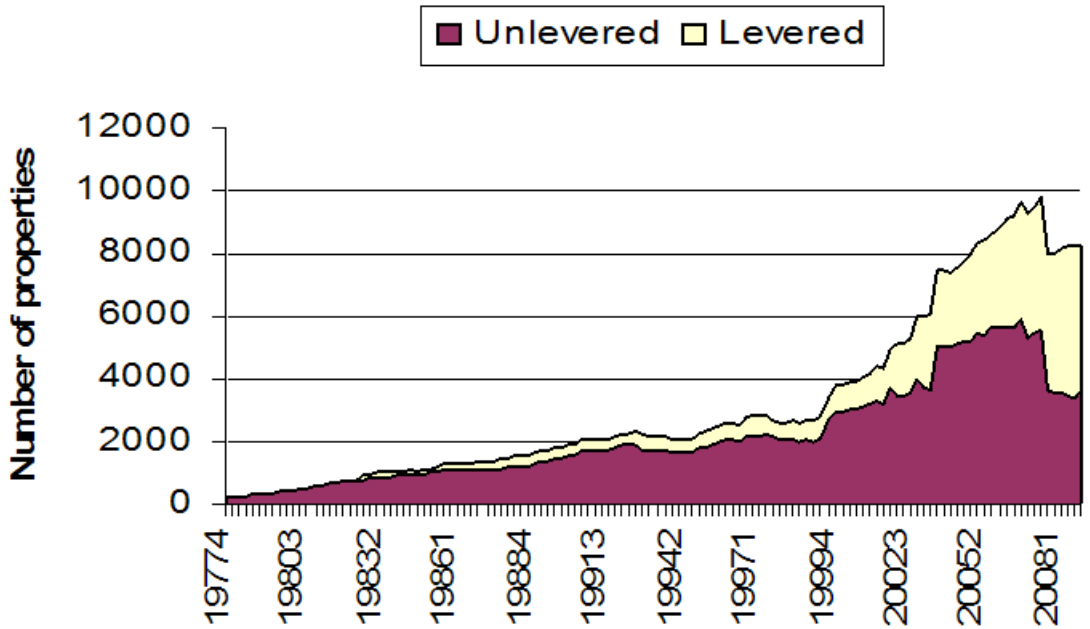

Figure 2: Recent Trend in Use of Leverage. Vertical axis: Property count. Horizontal axis: Time in quarter.