

The Pricing of Non-Core Real Estate Ventures

Estimating the net expected risk-adjusted return.

Joseph L. Pagliari, Jr.

For those familiar with institutional investment in commercial real estate, it comes as no surprise that the last five or so years have borne witness to a significant shift in focus—from so-called “core” properties to “non-core” properties. The former are generally characterized by low-leverage investments in fully leased apartment, industrial, office, and retail properties that are located in large metropolitan areas, whereas the latter essentially represent everything else. A recent survey of institutional investors indicates that more than two-thirds of their private domestic real estate equity capital for 2007 will be in non-core investments, leaving less than a third allocated to core investments.¹

In general, these non-core real estate investments can also be characterized as possessing one or more of the following traits: higher-return/higher-risk assets, greater leverage, shorter time horizons, and the use of a joint venture operating partner. Paradoxically, some real estate practitioners believe a core real estate portfolio can be transformed into a non-core venture simply by increasing the use of financial leverage.²

Despite the relatively recent enthusiasm for non-core real estate ventures, there is little in the way of available data on their performance because such ventures—particularly opportunity funds—are often cloaked in a veil of secrecy. The time series is also relatively short due to investor enthusiasm being a relatively recent shift in institutional behavior. Additionally, the performance of the commercial real estate market over the last ten or so years has been spectacular;³ but such environments are unlikely to reveal the *true* long-run performance of non-core real estate ventures. Accordingly, prudent investors often lack the tools and understanding to evaluate both

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ex ante and ex post performance of these non-core real estate ventures. This article attempts to help remedy that situation by exploring: 1) the use of leverage and the law of one price, 2) the effects of transaction costs and 3) the effects of joint venture partners. Axiomatically, the net expected risk-adjusted return is the metric by which these non-core real estate ventures ought to be priced. How to estimate that metric is more challenging, and, accordingly, is the topic of this paper.

LEVERAGE AND THE LAW OF ONE PRICE

Leverage Mechanics

In a world without income taxes,⁴ the key principles with regard to leverage were long ago enunciated by Modigliani and Miller [1958]. To paraphrase their seminal work: The total return to the levered equity position, k_e , is dictated by the spread between the asset-level total return, k_a , and the cost of indebtedness, k_d , and by the loan-to-value ratio, LTV , as summarized in the equation and the exhibit below:

$$k_e = \frac{k_a - k_d LTV}{1 - LTV} = k_a + (k_a - k_d) \frac{D}{E} \quad (1)$$

The far right-hand side of Equation (1) is the traditional corporate finance representation of the return to levered equity (where D = debt and E = equity), while the middle representation is an alternative—but equivalent—presentation often more familiar to real estate practitioners.

As illustrated in Equation (1) and Exhibit 1, leverage improves the return to the equity position only when the asset-level return exceeds the debt cost. The increase in the leverage ratio magnifies the outcome, in a geometrically increasing manner. Of course, the opposite is also true: *negative* leverage, $k_a < k_d$, worsens the equity return in a geometric manner as leverage increases.

And while whether leverage improves the return on equity is unknown at the time

of most investment decisions (because, while k_d may be known, k_a is not), it is known that leverage increases the riskiness of that return.⁵ Regardless of the asset-level return, the use of leverage magnifies the dispersion of the equity investor's outcomes. The impact of leverage critically influences the volatility of equity returns, σ_e , and it does so in a geometrically increasing way—in much the same manner as leverage influences the investor's return—as shown in the following equation and in Exhibit 2:

EXHIBIT 1
Illustration of Leveraged Equity Returns

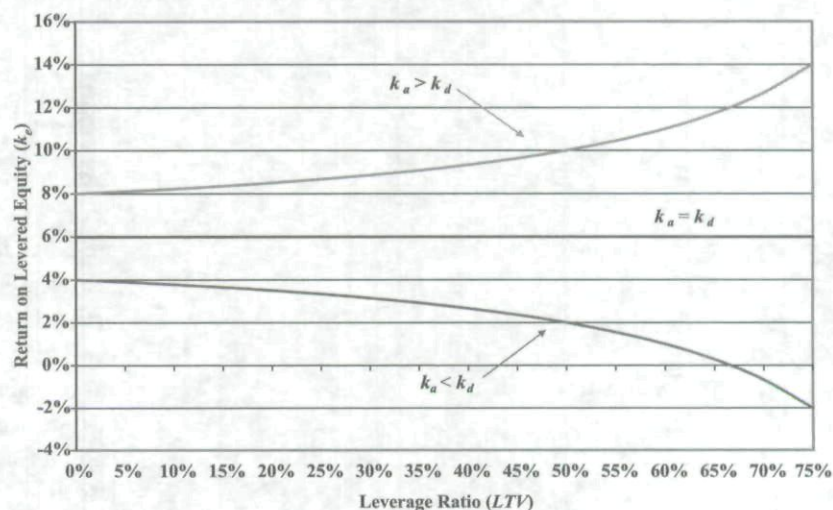
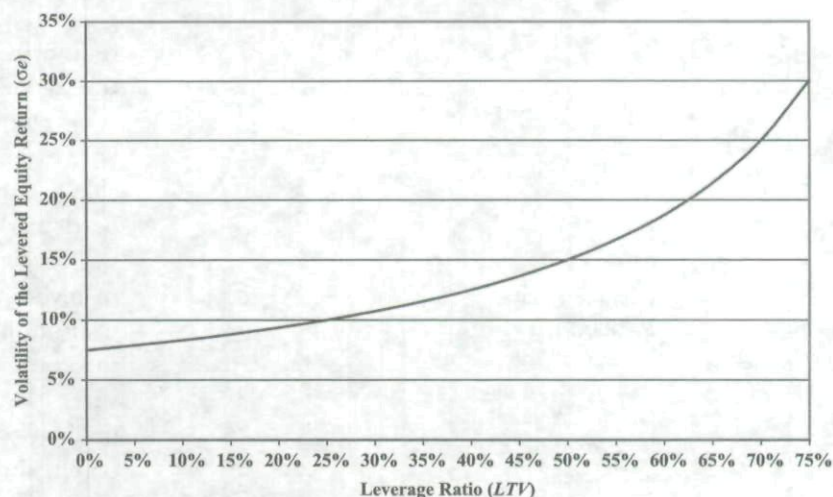


EXHIBIT 2
Illustration of the Volatility of Levered Equity Returns



$$\sigma_e^2 = \left(\frac{A}{E}\right)^2 \sigma_a^2 \Rightarrow \sigma_e = \frac{\sigma_a}{1-LTV} \quad (2)$$

where A = assets and σ_a^2 = the asset-level variance.

Combining Exhibit 1 (where $k_a < k_d$) and Exhibit 2 results in the leveraged risk-return tradeoff—often referred to as the no-free-lunch axiom—shown in Exhibit 3.

Exhibit 3 illustrates the no-free-lunch axiom because the *expected* increase in equity returns due to leverage is offset by the (unambiguous) increase in the volatility of the levered return, so that on a risk-adjusted basis, the levered returns are equivalent to the unlevered returns.

Leverage Mechanics: A Revision

The previous section assumes that the fixed-interest rate is constant across leverage ratios. This, of course, conflicts with both financial theory and market experience. Instead, the interest rate increases with the leverage ratio and the volatility of underlying assets. Merton [1974] was among the first to incorporate an option-pricing perspective to the endogenous setting of interest rates in the context of varying leverage ratios and varying asset-level volatilities. While an examination of his technique is beyond the scope of this paper, it is sufficient to indicate that increasing interest rates,⁶ as a function increasing leverage ratios and/or increasing asset-level volatilities, are observed in practice. The result, as illustrated in Exhibit 4, is a worsening of the risk-return tradeoff.

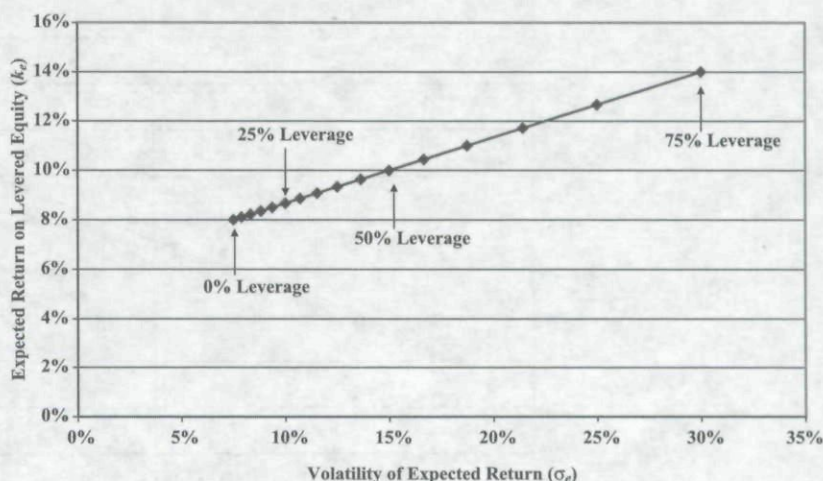
Option-pricing theory suggests that the relationship of required interest rates as leverage ratios and/or asset-level volatilities increase follows a curvilinear pattern similar to that displayed in Exhibit 4. Accordingly, the risk-return tradeoff begins to flatten out at the higher end of the risk-return spectrum.

The Law of One Price: Arbitrage Opportunities

The law of one price asserts that two assets with the same pattern of cash flows ought to have the same price. If not, an arbitrage opportunity exists by purchasing the undervalued opportunity and selling the overvalued opportunity.

EXHIBIT 3

Illustration of the Expected Return and Volatility of the Levered Equity Returns as Leverage Increases



The application to this discussion of the real estate investment landscape is simply that market efficiency would argue that levered core properties, as illustrated in Exhibit 4, are the alternative to various non-core alternatives; as such, all opportunities should align themselves in a risk-return context as illustrated below in Exhibit 5.⁷

A non-core venture is attractive if priced above the core-with-leverage alternative and is unattractive if priced below the core-with-leverage alternative as illustrated in Exhibit 6.

It is, of course, axiomatic that this comparison of risk-return alternatives is based on net returns. For many, if not most, of the publicly traded securities, the impact of transaction costs is relatively benign. The story is much different for privately traded real estate assets, particularly so for the short-term nature of many value-added and opportunistic real estate ventures. The analysis is further complicated by the dilution of expected returns due to the inclusion of a joint venture partner. Thus, we next turn our attention to these two factors.

TRANSACTION COSTS

As compared to publicly traded securities, the transaction costs associated with the acquisition and disposition of privately held real estate are quite high. These costs exert a powerful drag on returns.⁸ The round-trip costs to acquire and dispose of the real estate include legal

EXHIBIT 4

Illustration of the Risk/Return Tradeoff with Increasing Debt Costs as a Function of Increasing Leverage Ratios

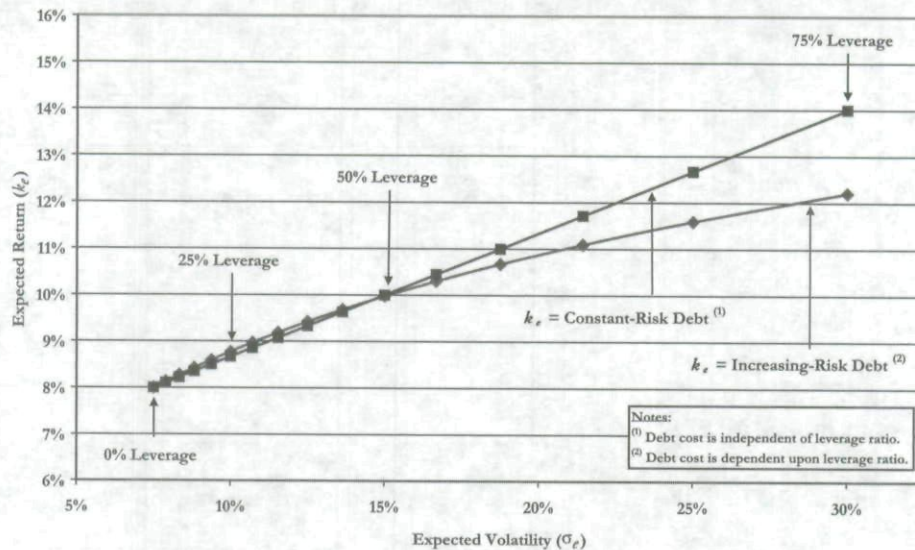
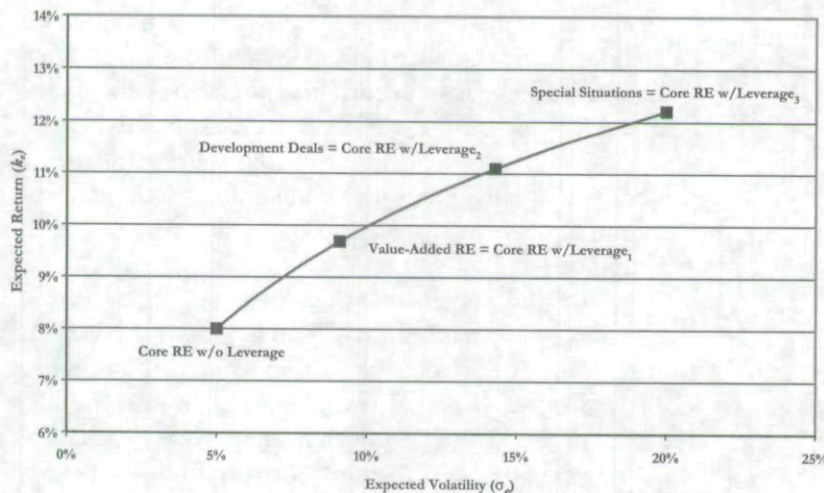


EXHIBIT 5

Illustration of Law of One Price



fees, due diligence costs, brokerage commissions, transfer taxes, and so forth.

Consider the following simple model that crudely approximates the annual drag on returns, γ , due to transaction costs:

$$\gamma = \frac{\text{Round - Trip Transaction Costs}}{\frac{\# \text{ Years in Holding Period}}{1 - LTV}} \quad (3)$$

Thus, it is apparent that transaction costs reduce gross returns as 1) the holding period shortens and/or 2) the loan-to-value ratio increases. As an example of such, assume that round-trip transactions costs equal 3.5% (e.g., 1.5% on the way-in and 2.0% on the way-out) of the purchase price. (For certain non-U.S. markets, these estimates may be exceedingly low.) We can then approximate the drag on return for a variety of holding periods and leverage ratios, as shown in Exhibit 7.

This matrix of outcomes (measured in γ) is revealing in the sense that core properties (and ventures or portfolios of core properties) tend to be characterized by long lives and low leverage ratios, whereas non-core properties (and portfolios of non-core properties) tend to be characterized by high leverage ratios and short lives. So, in the context of the approximation illustrated in Exhibit 7, non-core properties tend to incur a substantially more adverse reduction in returns. Loosely comparing the lower-left quadrant (as a proxy for non-core ventures) to the upper-right quadrant (as a proxy for core ventures) of Exhibit 7 suggests a difference of more than 200 bps per annum—and, in extreme cases, substantially more than 400 bps per annum.

EXHIBIT 6

Application of Law of One Price to Non-Core Ventures

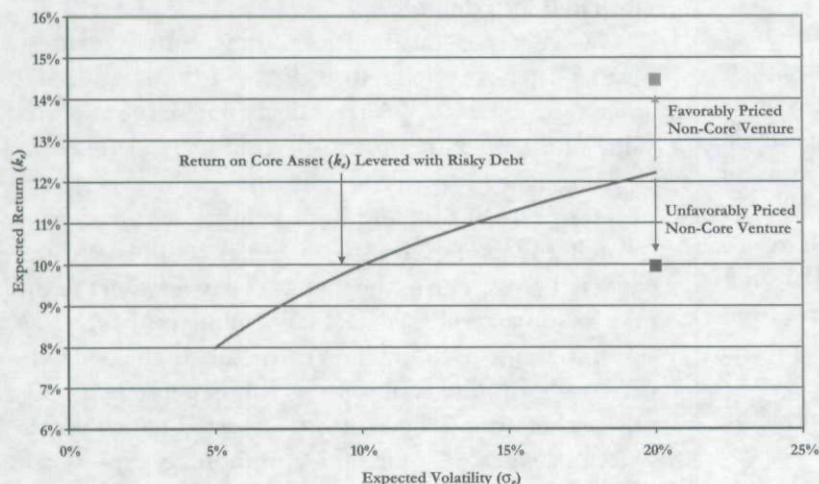


EXHIBIT 7

Approximate Reduction (%) in Return on Equity Due to Transaction Costs as a Function of Leverage and Holding Period

LTV Ratio	Holding Period									
	1	2	3	4	5	6	7	8	9	10
0%	3.50%	1.75%	1.17%	0.88%	0.70%	0.58%	0.50%	0.44%	0.39%	0.35%
10%	3.89%	1.94%	1.30%	0.97%	0.78%	0.65%	0.56%	0.49%	0.43%	0.39%
20%	4.38%	2.19%	1.46%	1.09%	0.88%	0.73%	0.63%	0.55%	0.49%	0.44%
30%	5.00%	2.50%	1.67%	1.25%	1.00%	0.83%	0.71%	0.63%	0.56%	0.50%
40%	5.83%	2.92%	1.94%	1.46%	1.17%	0.97%	0.83%	0.73%	0.65%	0.58%
50%	7.00%	3.50%	2.33%	1.75%	1.40%	1.17%	1.00%	0.88%	0.78%	0.70%
60%	8.75%	4.38%	2.92%	2.19%	1.75%	1.46%	1.25%	1.09%	0.97%	0.88%
70%	11.67%	5.83%	3.89%	2.92%	2.33%	1.94%	1.67%	1.46%	1.30%	1.17%
80%	17.50%	8.75%	5.83%	4.38%	3.50%	2.92%	2.50%	2.19%	1.94%	1.75%

To be fair, many transaction costs, stated as a percentage of the purchase price, decline as the price increases. And, accordingly, Equation (3) may overstate the effect of transaction costs. For example, the brokerage community often reduces its fee (again, stated in percentage terms) as the price increases, so that the brokerage commission (as a percentage) on a \$100 million sale tends to be smaller than on a \$10 million sale. However, there are other costs that are invariant to size, such as the local government's transfer taxes. Moreover, size or scale is not the only determinant of transaction costs. Greater complexity and speed are often two elements that contribute to higher transaction costs. On this dimension, non-core properties often display greater complexity and/or execution speed than their core counterparts.

The point is not to quibble over the precise relationship of transaction costs to scale, complexity, and speed, but rather to acknowledge the substantial drag on returns due to real estate's significant transaction costs and to acknowledge that this drag tends to fall more heavily on non-core properties.

JOINT VENTURE PARTNERS

This brings us to what is often the least understood aspect of non-core real estate ventures—the effects of including a joint venture partner. Though not always an element of non-core investing, the inclusion of a joint venture operating partner is a prevalent feature of non-core strategies. The joint venture partner is typically provided an incentive fee, and the option-like nature of this contingent interest dilutes the investor's expected return as well as created certain behavioral characteristics in the joint venture operating partner. Let's examine these effects.

Joint Ventures: Benefits and Costs

The prevalence of including a third-party operator in non-core real estate strategies is a function of the purported benefits of such operators. From the standpoint of

the passive real estate investor, these benefits include access to off-market deals and to asset- and/or market-specific expertise vested in the joint venture operating partner, as well as the potential for excess risk-adjusted returns. The nature of non-core real estate ventures tends to emphasize these very benefits; because non-core properties tend to involve specialized expertise and are expected to generate out-sized returns.

These benefits must, of course, be assessed in the context of the costs of such ventures. These costs include: monitoring and supervision costs, additional legal complexities, issues of control, the risk of a "bad" operating partner and the operating partner's contingent interest. All but the last of these costs are fairly straightforward; the last cost requires some elaboration and is discussed in the next section.

Joint Ventures, Investors' Net Returns, and the Law of One Price

Like leverage, joint ventures are neither inherently good nor bad. Like leverage, the use of joint ventures alters the investor's net return distribution.⁹ The joint venture partner is generally provided an incentive fee, typically in the form of a share of the venture's profits after a certain minimum return has been realized. More specifically, the investor often receives a preferred return, or the *preference*, which is an annual return based on invested capital; after which, the operating partner receives a participation in the excess profits, the *promoted* interest or more simply the *promote*, should excess profits be available.

The expected value of the option-like nature of the operator's participation, π , is given by

$$E(\pi) = \int_{\psi}^{\infty} \kappa(x - \psi) f(x) dx \quad (4)$$

where ψ = the investor's preference, κ = the operating partner's percentage participation in excess returns, and $f(x)$ = the distribution of venture-level returns, x .¹⁰

From Equation (4), it is readily apparent that the value of the promote is always positive and, therefore, always dilutes the passive investor's expected net return by the expected value of π . However, the reason to include an operating partner is the expected improvement in venture-level returns.¹¹ When making an ex ante evaluation of a joint venture investment, it is important to forecast both the venture-level return (with the exception of the operating partner's contingent interest, after having considered the additional aforementioned costs) and the investor's expected net return.

An example perhaps best illustrates this point. Consider a particular joint venture for which the expected venture-level return, $E(x)$, equals 12% per annum¹² with volatility, σ , of 15%. Moreover, assume that the investor and operating partners agree to an investor preference, ψ , of 12%¹³ with the operating partner participating, κ , in 50% of the excess profits.¹⁴

The nature of these agreements creates the option-like characteristics of the operating partner's promote. Consequently,

the operating partner's participation (sometimes also referred to as the *scrape*) truncates the investor's upside as illustrated in Exhibit 8.

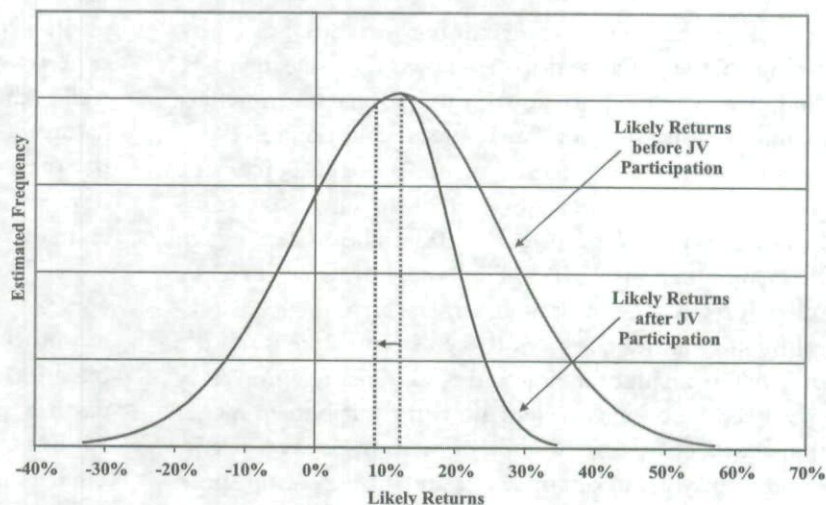
Given these assumptions, the result is that the investor's net expected return, $E(x) - E(\pi)$, is reduced to approximately 9.0%.¹⁵ Alternatively stated, the expected value of the operating partner's contingent claim, $E(\pi)$, equals roughly 3.0%. Herein lies one of the least understood aspects of utilizing joint venture partners. Even though the preference is set equal to the venture's expected gross return, the investor's expected net return may be substantially reduced, depending on $E(x)$, σ , ψ , and κ . Because of the asymmetric nature of the operating partner's promote, computing the expected value of the promote using the venture's expected return understates the expected value of the promote, as expressed in equation

$$\kappa[E(x) - \psi] < E(\pi) = \int_{\psi}^{\infty} \kappa(x - \psi) f(x) dx \quad (5)$$

Because of the prevalence of utilizing third-party operating partners when investing in non-core real estate opportunities, understanding this distinction is critical to fairly assessing the investor's net expected return.

Given these same assumptions, the volatility of the investor's net expected return is reduced to approximately

EXHIBIT 8
Illustration of Venture-Level Returns
Before and After the Venture Partner's Participation



11.5%, as compared to the 15% volatility, σ , of the venture's gross return. As shown in Exhibit 8, the dispersion of returns is narrower after considering the operating partner's participation. While the lowered standard deviation is true in a statistical sense, the lowered standard deviation is also a statistical illusion in the sense that the investor's downside risk is unchanged by the operating partner's participation. Because the distribution of the investor's net expected return is negatively skewed, the standard deviation understates the investor's risk. Accordingly, the volatility of the venture's gross return (15% in this example) is a better comparative measure.

Using the volatility of the venture's gross return and the investor's net expected return, the law of one price can be applied¹⁶ to determine if the non-core venture offers a better risk-adjusted return than the core-with-leverage alternative. Given the assumptions of this example, a comparison is described in Exhibit 9.

Obviously, the non-core venture provides a lower risk-adjusted return compared to the core-with-leverage alternative. However, this is merely an illustration and not necessarily intended to represent current market conditions. In fact, this is not a static analysis as the parameters ($E(x)$, σ , ψ , and κ) change with market conditions.¹⁷

Expected Promote Increases with Volatility

As with any option-like instrument, the expected value of the asymmetric payoff increases with the volatility of the underlying asset. The same is true for the expected value of the operating partner's participation—the greater the volatility of the joint venture's expected return, the greater is the expected value of the promote. This feature is illustrated in Exhibit 10.

Exhibit 10 assumes that the volatility of Asset 1 exceeds Asset 2, and accordingly illustrates that the expected value of the promoted interest is greater for Asset 1. Given our earlier assumptions concerning $E(x)$, ψ , and κ , Exhibit 11 examines the impact on the investor's expected net return and the expected value of the operating partner's promote for a range of venture-level volatilities, σ .

EXHIBIT 9

Illustration of Applying Law of One Price to a Specific Non-Core Venture

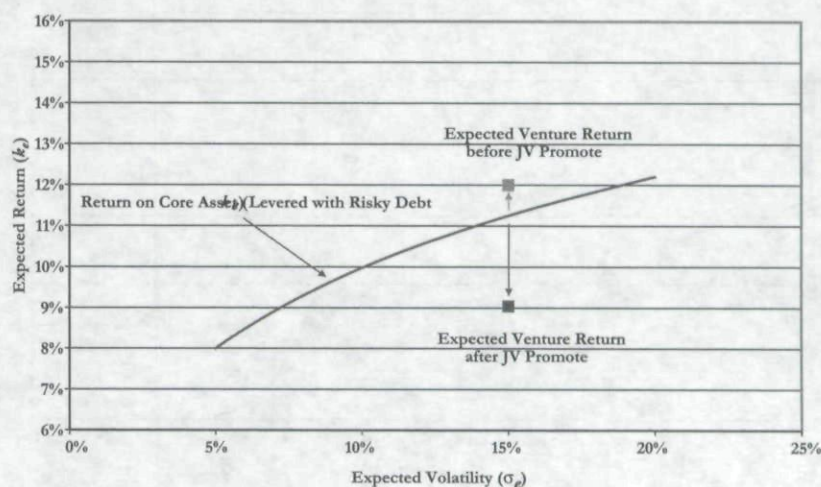


Exhibit 11 illustrates a near-linear relationship between the expected value of the operating partner's promote and the venture-level volatilities. Thus, ventures with extreme levels of volatilities create situations in which the expected value of the operating partner's promote may exceed the expected value of the investor's net return. Of course, investors can protect themselves from such outcomes by demanding higher venture-level returns, $E(x)$; higher preferences, ψ , and/or smaller participation percentages, κ .

Agency Effects

Operating partners, like other economic agents inside and outside of real estate,¹⁸ respond rationally to the incentive fees typically found in non-core ventures. As such, operating partners examine their unrealized incentive fee (i.e., after consummating the investment structure, but before the investment concludes). If the fee is *in the money*, the operating partner tends to make conservative investment decisions going forward. Conversely, if the fee is *out of the money*, the operating partner tends to make aggressive investment decisions going forward.¹⁹

To better understand this agency effect, consider two contrasting examples. In the case of the operating partner whose promote is in the money, the operating partner—to oversimplify—can either choose a conservative or a risky action. On the one hand, the conservative action leaves the operating partner's promote essentially

EXHIBIT 10

Illustration of Increasing Expected Value of the Promote as Venture Volatility Increases

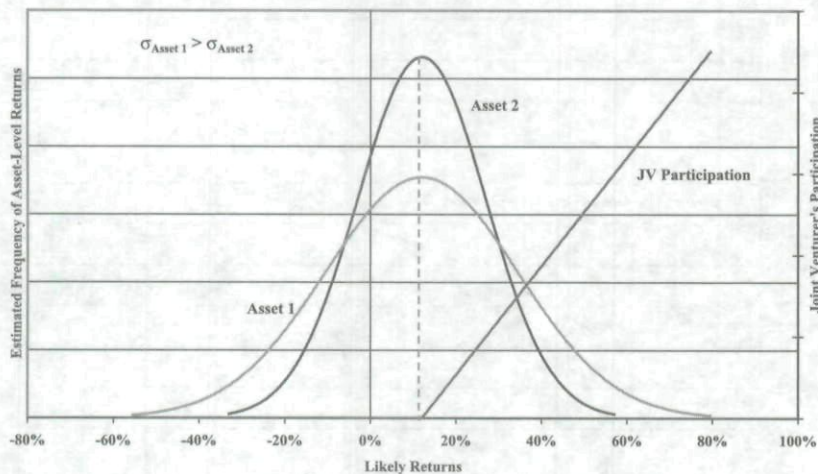
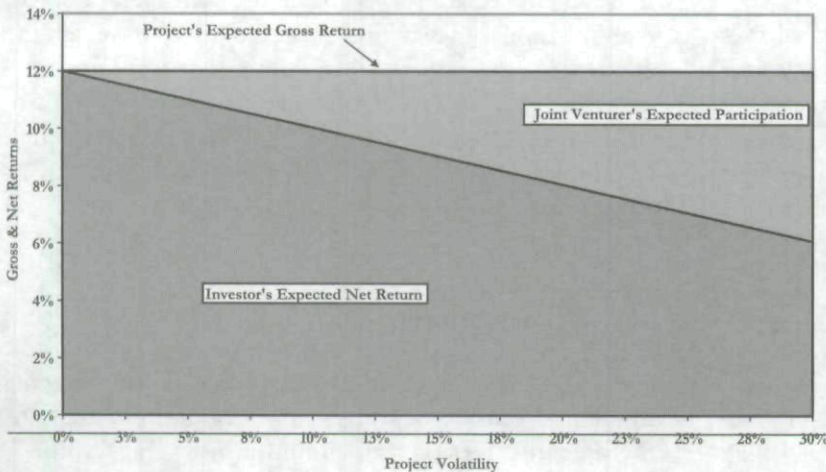


EXHIBIT 11

Illustration of Joint Venturer's Increasing Expected Participation as Project Volatility Increases



unchanged.²⁰ On the other hand, the risky action will result in a substantial worsening of the venture's profitability if the risky matter is unfavorably resolved, but will result in a substantial improvement of the venture's profitability if the risky matter is favorably resolved.²¹

The choice for the operating partner whose promote is in the money looks something like that crudely depicted in Exhibit 12.

This operating partner, assuming the governance provisions of the venture agreement provide such latitude,²² will tend to choose the conservative action (the middle of the

three arrows shown in Exhibit 12) because the marginal utility of the increased promote is of little value when compared to the potential risky action resulting in the complete loss of the promote.²³

The choice for the operating partner whose promote is out of the money looks something like that crudely depicted in Exhibit 13.

This operating partner, again assuming the governance provisions of the venture agreement provide enough latitude, will tend to choose the risky action, which, if it pays off, will move the operating partner's promoted interest into the money (the right-most of the three arrows shown in Exhibit 13), because there is no downside risk to the operating partner (who cannot earn less than the zero promote currently anticipated).²⁴ Such is the behavioral nature of these types of asymmetric payoffs. However, this penchant for risk-taking is mitigated by the adverse reputational effects of significant under performance. Because operating partners typically engage in repeat business, they are perhaps more likely to devote their efforts and finite resources to other ventures for which the likelihood of realizing a significant promote is better.

Some Empirical Observations

The use of joint ventures is prevalent throughout real estate.²⁵ As indicated earlier, the institutional use of joint venture partners has increased dramatically in the last five or so years. It is well known on the public side, for example, that several REITs—

including AMB, Kimco, and ProLogis (Kirby [2006])—have substantial fund management businesses in which the REIT acts as the fund's operating partner, and accordingly reaps the economic rewards and incentive fees previously outlined.²⁶ Some REITs have ventured with developers, such as Equity Residential with the Lincoln Property Company, to develop new properties for the REITs' portfolios, while other REITs have ventured with advisors, such as Federal Realty Trust with Clarion's Lion Property Fund, to jointly acquire existing properties. Thus, various REITs are on either side of this joint venture question.

EXHIBIT 12

Illustration of Operating Partner's Conservative Proclivities when the Promoted Interest is In the Money

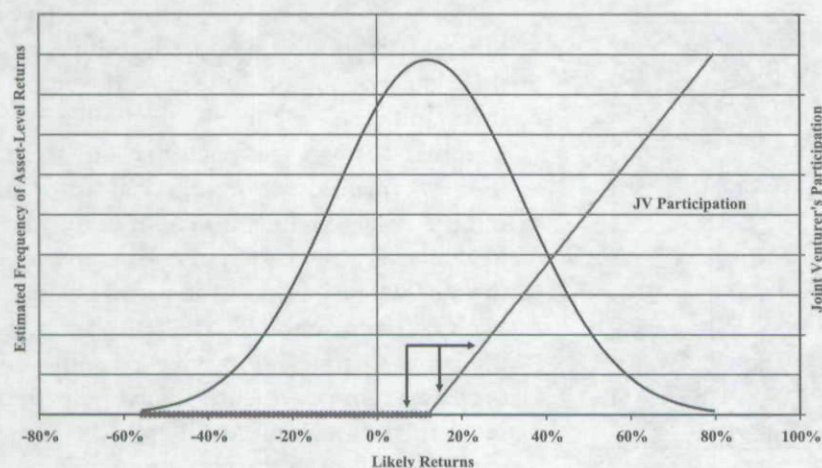
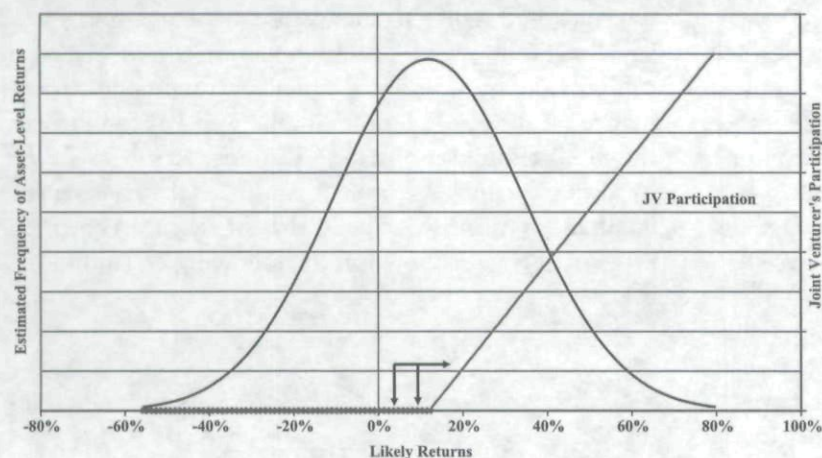


EXHIBIT 13

Illustration of Operating Partner's Aggressive Proclivities when the Promoted Interest is Out of the Money



On the private side, the use of joint ventures is also increasing. Consider the experience of the NCREIF Property Index (NPI). Exhibit 14 summarizes the percentage of properties held in joint ventures as compared to the total value of the index and also indicates the property-type breakdown of these joint ventures.

Exhibit 14 is notable in two respects. First, office and retail joint ventures (indexed to the left-hand axis) are by far, having averaged more than 80% of all such ventures, the most common property types, in which to find joint ventures.²⁷ Second, the level of all joint ventures (indexed

to the right-hand axis) has averaged approximately 10% of the entire NPI through 1997 and has averaged approximately 25% since then, with the most recent percentage at approximately 30% of the NPI.

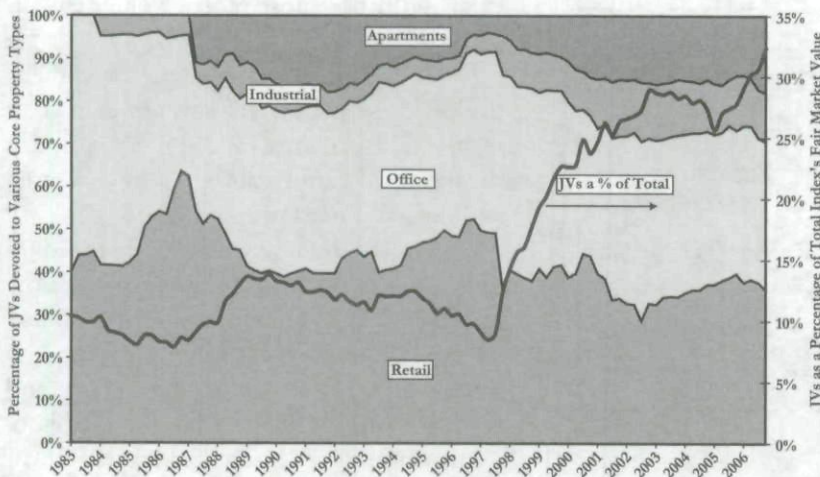
Of course, the other interesting dimension of these private joint ventures is their relative performance. Exhibit 15 contrasts the historical performance of joint-ventured and non-ventured properties.

The figures in Exhibit 15 are based on gross returns (i.e., before the impact of the joint venture's promote). As such, they should be warily interpreted. Nevertheless, certain outcomes are interesting: On average, and over the entire 1983–2006 sample period, joint-ventured properties generated returns 1.89% (column *k* of Exhibit 15) higher than non-ventured properties. Within the core property types, the office sector clearly benefited the most with returns to joint-ventured office properties exceeding non-ventured properties by 2.61% (column *n* of Exhibit 15). Yet, returns to joint-ventured apartment properties were barely positive at just 0.13% (column *l* of Exhibit 15). From a statistical sense, only the differences to joint-ventured office and retail properties were significantly different from zero.²⁸ To reiterate, however, these are gross returns. Therefore, there is no way to know how well the investor partner fared without also knowing the economic terms of each joint venture. On average, and over the more recent 1998–2006 sample period,²⁹ joint-ventured properties generated gross returns only 0.73% (column *k* of Exhibit 15) higher than non-ventured properties. Within the core prop-

erty types, returns are more homogenous in this more recent period.³⁰ Again, whether these gross returns provided enough of an increase to offset the operating partner's participation in the excess profits depends upon the economic terms of each joint venture. That being said, it seems clear that the investors' net returns have been less compelling in the more recent time period. If so, that does not necessarily make the ventured (net) returns less attractive than the non-ventured returns; it could simply be the case that the earlier period, from 1983 to 1997, was one where first-mover advantages were quite significant.

EXHIBIT 14

Percentage of Joint-Ventured Properties in the NCREIF Property Index 1983-2006



The volatility of ventured and non-ventured properties is also interesting: Based on the entire 1983-2006 sample period, overall volatility of joint-ventured properties was 0.36% higher than non-ventured properties (compare the third-to-last row of column *a* to column *f* in Exhibit 15).³¹ This is somewhat misleading in that the volatility of ventured properties was—compared to non-ventured properties—substantially higher for apartment and retail properties at 1.56% and 1.77%, respectively, while the volatility of ventured properties was lower for industrial and office properties at -0.30% and -0.87%, respectively. The decline in volatility seems somewhat counterintuitive. The nature of ventured properties is that they are often more volatile than the non-ventured properties. However, it might also be that operating partners reduced risk while at the same time increased return. Based on the more recent 1998-2006 sample period, the overall volatility of joint-ventured properties was 0.35% lower than non-ventured properties (compare the last row of column *a* to column *f* in Exhibit 15). Again, the volatility of ventured properties was higher—compared to non-ventured properties—for apartment and retail properties at 0.35% and 0.49%, respectively, while the volatility of ventured properties was lower for industrial and office properties at -1.37% and -0.44%, respectively.

Return and risk can be jointly examined by using the Sharpe ratios of ventured and non-ventured properties.³² In the aggregate, and over the entire time period, the Sharpe ratio of ventured properties exceeded

non-ventured properties by 0.26 (i.e., 0.86 less 0.60), and in the more recent 1998-2006 time period, the difference improved to 0.30 (i.e., 1.99 less 1.69). However, these differentials are almost entirely confined to the industrial and office sectors; the apartment and retail sectors saw negligible differentials. Many practitioners may find these results surprising as the industrial sector is often considered the most commodity-like of the core property types and, therefore, the area where an operating partner is least likely to improve the Sharpe ratio. Yet, the industrial sector has experienced some of the largest improvements. Conversely, the retail sector is often considered the least commodity-like of the core property types and, therefore, the area where an operating partner is most likely to improve the Sharpe

ratio. Yet, the retail sector has experienced some of the smallest improvements.

Because these differentials are measured on a gross return basis, this then naturally leads to the question: How large might the operating partner's promote have been and still provide the investing partner with the same performance (as measured by the Sharpe ratio) as found with the non-ventured properties? The answer can be found by solving for the net ventured return such that, on average, its Sharpe ratio, SR_{JV} , equals that of the non-ventured property, SR_{NV} , as shown in the following equation:

$$SR_{JV} = SR_{NV}$$

$$\frac{r_{JV} - E(\pi) - r_f}{\sigma_{JV}} = \frac{r_{NV} - r_f}{\sigma_{NV}} \quad (6)$$

where r_{JV} = gross return from ventured properties; $E(\pi)$ = the expected value of the operating partner's promote (as defined in Equation (4)); r_f = the risk-free rate of interest; σ_{JV} = volatility of gross returns from ventured properties; r_{NV} = gross return from non-ventured properties; and σ_{NV} = volatility of gross returns from non-ventured properties. More specifically, $E(\pi)$ is conditioned upon the realized r_{JV} and σ_{JV} for each time period, while the combinations of the preference, ψ , and the promote, κ , are identified so as to solve Equation (6), assuming normally distributed venture-level returns, given that the realized SR_{NV} is already known. The results of these combinations,

EXHIBIT 15

Comparison of the Performance of Joint-Ventured and Non-Ventured Properties in the NCREIF Property Index 1983-2006

Year Ended	Joint-Ventured Properties					Non-Ventured Properties					Difference				
	Total	Apartment	Industrial	Office	Retail	Total	Apt	Industrial	Office	Retail	Total	Apt	Industrial	Office	Retail
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k) = (a) - (f)	(l) = (b) - (g)	(m) = (c) - (h)	(n) = (d) - (i)	(o) = (e) - (j)
1983	16.08%			15.22%	17.56%	12.80%	18.85%	12.77%	12.36%	13.29%	3.28%			2.86%	4.27%
1984	16.10%		5.71%	14.26%	19.95%	13.58%	13.13%	13.51%	12.19%	16.38%	2.52%		-7.80%	2.07%	3.57%
1985	19.17%		14.72%	10.33%	29.59%	10.54%	11.59%	12.19%	8.93%	12.34%	8.62%		2.53%	1.40%	17.25%
1986	13.11%		17.21%	9.65%	14.65%	7.88%	7.10%	8.52%	5.43%	12.11%	5.23%		8.69%	4.21%	2.53%
1987	14.40%		22.66%	17.49%	13.10%	7.35%	6.18%	9.64%	2.99%	12.23%	7.05%		13.03%	14.50%	0.87%
1988	14.37%	17.14%	15.93%	13.32%	15.09%	8.97%	8.22%	9.65%	5.16%	14.86%	5.40%	8.92%	6.28%	8.16%	0.23%
1989	12.90%	12.70%	15.19%	12.86%	12.80%	6.98%	7.50%	8.45%	2.88%	12.48%	5.92%	5.20%	6.74%	9.98%	0.32%
1990	5.71%	8.44%	7.27%	3.43%	6.53%	1.79%	4.87%	1.75%	-1.68%	5.85%	3.92%	3.57%	5.52%	5.11%	0.68%
1991	-3.66%	0.91%	1.96%	-8.44%	-1.52%	-5.87%	-1.94%	-4.04%	-11.89%	-1.92%	2.21%	2.85%	6.00%	3.45%	0.40%
1992	-4.73%	-3.08%	-4.07%	-6.86%	-3.64%	-4.20%	2.78%	-4.49%	-8.23%	-1.96%	-0.54%	-5.86%	0.42%	1.36%	-1.68%
1993	2.19%	-2.95%	3.04%	1.87%	4.15%	1.29%	10.55%	-0.88%	-4.90%	4.93%	0.90%	-13.50%	3.92%	6.77%	-0.78%
1994	5.23%	9.28%	8.84%	3.11%	5.82%	6.55%	12.42%	7.60%	4.09%	6.03%	-1.32%	-3.14%	1.24%	-0.98%	-0.21%
1995	5.54%	9.43%	8.36%	7.24%	3.24%	7.79%	11.86%	12.41%	7.17%	4.12%	-2.25%	-2.43%	-4.05%	0.07%	-0.88%
1996	10.14%	13.41%	14.64%	11.73%	8.10%	10.32%	11.42%	13.54%	13.84%	4.35%	-0.18%	1.99%	1.10%	-2.12%	3.75%
1997	12.19%	11.04%	6.15%	17.14%	8.21%	14.08%	12.94%	16.18%	17.98%	8.59%	-1.89%	-1.91%	-10.03%	-0.84%	-0.38%
1998	13.47%	13.73%	11.00%	15.18%	12.04%	16.79%	14.11%	16.37%	20.59%	13.07%	-3.32%	-0.38%	-5.37%	-5.40%	-1.03%
1999	11.20%	14.30%	11.42%	11.20%	10.23%	11.40%	11.40%	11.69%	12.48%	9.12%	-0.20%	2.89%	-0.27%	-1.28%	1.11%
2000	11.45%	13.71%	14.48%	14.95%	7.89%	12.57%	12.78%	13.99%	14.09%	7.77%	-1.12%	0.93%	0.49%	0.86%	0.12%
2001	6.75%	9.05%	9.31%	5.93%	6.33%	7.56%	9.40%	9.50%	6.35%	7.20%	-0.80%	-0.36%	-0.20%	-0.42%	-0.87%
2002	10.26%	9.49%	9.94%	6.28%	16.31%	5.53%	8.52%	6.29%	1.60%	11.67%	4.73%	0.96%	3.65%	4.68%	4.63%
2003	10.46%	8.46%	8.80%	6.04%	18.02%	8.71%	9.09%	8.17%	5.77%	17.37%	1.75%	-0.62%	0.63%	0.27%	0.65%
2004	17.25%	15.65%	15.07%	13.65%	23.22%	13.59%	12.36%	11.53%	11.47%	23.11%	3.66%	3.28%	3.54%	2.18%	0.11%
2005	20.49%	22.24%	16.88%	20.11%	21.43%	20.04%	21.05%	21.02%	19.53%	18.77%	0.45%	1.18%	-4.15%	0.58%	2.66%
2006	17.54%	13.81%	17.45%	22.77%	13.83%	16.15%	14.95%	16.82%	17.65%	12.83%	1.39%	-1.14%	0.63%	5.12%	1.00%
1983-2006:															
Average	10.73%	10.35%	10.95%	9.94%	11.79%	8.84%	10.46%	9.67%	7.33%	10.19%	1.89%	0.13%	1.42%	2.61%	1.60%
Volatility	6.52%	6.41%	6.06%	7.64%	7.83%	6.17%	4.85%	6.36%	8.50%	6.06%	3.18%	4.66%	5.34%	4.29%	3.77%
Sharpe Ratio	0.86	0.91	0.99	0.63	0.85	0.60	1.10	0.71	0.26	0.83	0.26	-0.18	0.27	0.37	0.02
1998-2006:															
Average	13.21%	13.38%	12.71%	12.90%	14.37%	12.48%	12.63%	12.82%	12.17%	13.43%	0.73%	0.75%	-0.12%	0.73%	0.93%
Volatility	4.38%	4.23%	3.31%	6.14%	5.86%	4.72%	3.87%	4.68%	6.58%	5.37%	2.48%	1.55%	3.02%	3.17%	1.78%
Sharpe Ratio	1.99	2.10	2.48	1.37	1.68	1.69	2.10	1.78	1.17	1.66	0.30	0.00	0.70	0.20	0.02

assuming $\psi \geq 5\%$ and $0 < \kappa < 60\%$, are illustrated in Exhibit 16.

The solid lines represent the combinations of the investor's preference, ψ , and the operating partner's promote, κ , such that the ventured and non-ventured properties produce identical Sharpe ratios to the investor. If the investor's actual combination of preference and promote lies above the line, then the investor would have fared better with the non-ventured properties. Conversely, if the actual combination lies below, then the investor would have fared better with the ventured properties.³³ As an example, assume the investor was to receive an 8% preference (the dashed vertical line in Exhibit 16), then the operator's promote would have to have been less than 40% (the upper dashed horizontal line) in order for the investor to have fared better with ventured properties in the 1983-2006 time period. For the same 8% preference, the operator's promote would have to have been less than approximately 25% (the lower dashed horizontal line) in

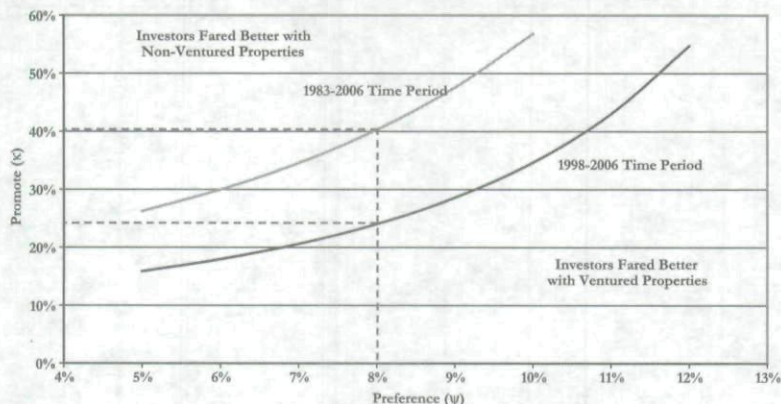
order for the investor to have fared better with ventured properties in the 1998-2006 time period.

The placement of these indifference curves for the entire (1983-2006) and the more recent (1998-2006) time periods also indicates that it has become more difficult of late for ventured properties to provide investors with net risk-adjusted returns, as measured by the Sharpe ratio, that outperformed non-ventured properties.³⁴

These empirical results should be viewed as indicative rather than definitive. There are many reasons to be quite circumspect about drawing definitive conclusions. These reasons include the fact that the sample is drawn from a limited cross-section of real estate investors, the property types found in the sample tend to be core property types, and these properties are stabilized, that is, they exclude many value-added and opportunistic investment, or non-core, strategies.³⁵ In addition, the data are confined to U.S. investments (other countries may have other experiences). And, perhaps most importantly, there is no way

EXHIBIT 16

Trade-off between Preference (ψ) and Promote (κ) such that the Average Sharpe Ratio of Ventured Properties (Net of the Promote) Equals the Average Sharpe Ratio of Non-Ventured Properties



to know how well the investor partner fared without also knowing the economic terms of each joint venture.

CONCLUSION

The last several years have witnessed a significant shift from core investments to non-core ventures. Despite the relatively recent enthusiasm for non-core real estate ventures, there has been scant discussion of how to price these transactions and little empirical investigation into their performance. This article attempts to help remedy that situation by examining three aspects of non-core real estate investing.

First, investors must understand the impacts of financial leverage on both expected return and volatility. They must also understand how the law of one price can be used to price non-core ventures by comparison to the core-with-leverage alternative.

Second, the adverse effects of transaction costs upon investors' return are substantial in private real estate. These effects worsen as the holding period shortens and/or the leverage ratio increases.

And third, the effects of joint venture partners must be clearly understood. Joint ventures typically impose additional direct costs—such as monitoring and supervision and legal complexity—and indirect costs—such as issues of control and the risk of a “bad” partner—while also diluting the investor's expected net return. In return for these costs, however, the operating partner is expected to provide certain benefits, such as access to off-market

deals and asset- and/or market-specific expertise. Whether the benefits outweigh the costs ought to be measured in comparison to the investor's core-with-leverage alternatives. It should also be recognized that the option-like incentive fees typically found in joint venture agreements create certain incentives in the operating partner. In the case of the unrealized promote which is in the money, the operating partner is likely to pursue conservative actions in order to preserve the promote. Conversely, in the case of the unrealized promote which is out of the money, the operating partner is likely to pursue risky actions in an attempt to reach the promote, while the operating partner's downside is capped at zero. However, this penchant for risk-taking is mitigated by the adverse reputational effects of significant

underperformance. Instead, these operating partners are perhaps more likely to devote their resources to other ventures with better chances of realizing a significant promote.

Finally, a preliminary examination of the NCREIF data regarding joint-ventured properties suggests that the office and industrial sectors possibly provided investors with improved risk-adjusted rates of return. However, these conclusions are quite preliminary. Among other factors, more needs to be known about the economic terms of the underlying venture agreements before definitive performance conclusions can be drawn.

ENDNOTES

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¹A survey of many of the largest U.S. pension plans expects net capital flows to real estate of approximately \$44.5 billion in 2007. Of this amount, \$36.3 billion is projected for private domestic real estate investments. Of this amount, more than 68% is targeted for value-added and opportunistic (i.e., non-core) investments. See Kingsley Associates and Institutional Real Estate, Inc., 2007. Core real estate holdings of tax-exempt investors have decreased as a percentage of their total real estate holdings from 70% of private real estate equity investments in

2004 to 62% on average in 2006. See 2007 PREA Plan Sponsor Survey.

²This represents a paradox because financial economics suggests that investors can alter the leverage ratio themselves and, thereby, separate asset-level risk and return from debt financing-induced risk and return. See Modigliani and Miller [1958]. This paradox seems less frequently encountered when speaking with European real estate investors who, by and large, more appropriately view the leverage decision independently of the asset-choice decision.

³Consider, for the ten years ended in 2006, the following annual (compounded) returns: domestic equities (proxied by the S&P 500) at 8.4%; international equities (EAFE) at 8.1%; long-term government bonds at 7.8%; Treasury bills at 3.6%; public real estate equities (NAREIT) at 14.5%, and (unlevered) private real estate equities (NCREIF) at 12.7%, while inflation averaged 2.4% annually. Source: Ibbotson Associates.

⁴The absence of income taxes is particularly apt to institutional real estate investing, wherein tax-exempt investors, such as real estate investment trusts and pension and endowment plans, are a significant and active component of the commercial real estate market.

⁵For analytical convenience, this paper assumes fixed-rate mortgage financing over the projected holding period. As such, the debt is riskless (i.e., $\sigma_d = 0$) from the borrower's perspective. An assumption about variable-rate debt (and/or fixed-rate debt which is marked to market) is beyond the scope of this article.

⁶It is more accurate to indicate that these rates reflect spreads to the underlying reference rate (often U.S. Treasury bonds).

⁷Fisher and Geltner [2002] advocate a similar approach when evaluating development opportunities.

⁸In a similar fashion, the loan origination fees and costs should be considered as a reduction of the loan-to-value (LTV) ratio and an increase in the loan's effective interest rate, k_d .

⁹While this presentation is made from the perspective of the passive investor, the analysis can be reversed and made from the perspective of the operating partner.

¹⁰In practice, it is usually easier to implement the discrete version of Equation (4):

$$\pi = \sum_{\psi} \kappa(x_i - \psi) w_i$$

where: w_i = the probability of return x_i .

¹¹Other reasons for a joint venture investment include:

- a) a property owner who feels values may be approaching a cyclical high (or, equivalently, the owner may wish to diversify away much of the idiosyncratic risk associated

with his/her concentrated portfolio), but wishes to maintain an interest in the property's future management while liquefying a portion of his/her equity;

- b) a property owner who would otherwise like to sell his/her property, but perceives the tax consequences of a property sale to be quite onerous; the use of a joint venture structure may defer (some or all of) the existing owner's tax liability;
- c) a domestic investor's desire to acquire real estate in a foreign country; in such cases, the use of a local partner is often *de rigueur* (whether or not the local partner actually adds value or, instead, acts as another tax, depends on circumstances and local custom); and
- d) an operating partner who contributes substantial equity, provides exclusivity (with regard to future deals), or provides construction and/or lease-up guarantees.

¹²The venture-level return should reflect the additional expenditures for monitoring, supervision, and legal costs, as previously noted.

¹³Typically, the preference is set at or near the venture's expected gross return (i.e., $\psi \approx E[x]$).

¹⁴A multitude of ways exists in which the sharing aspects of the venture can be designed (e.g., *waterfall* and *catch-up* provisions), as well as an infinite array of preference and promote combinations. The intention here is to illustrate a very simple design.

¹⁵These results were derived by assuming, for analytical convenience, that venture-level returns are normally distributed; however, this assumption is not imperative.

¹⁶This application of the law of one price is an approximation: The relationship between risk and return typically assumes a normal (or lognormal) distribution, whereas the investor's return in ventured properties is inherently skewed to the downside. In this sense, the work of Ang et al. [2006] concerning the valuation of downside risk in common stocks has some bearing in this regard.

¹⁷As a consequence of increasing investor enthusiasm for non-core ventures, it is generally believed that the last five or so years have witnessed a decline in the preference, ψ ; an increase in the promote, κ ; and a shift in the governance/control provisions regarding major leases, capital expenditures, refinancing, and so forth that favors the operating partner. Additionally, this enthusiasm has also led to an expansion of the pool of institutionally acceptable operating partners.

¹⁸This includes investment managers of all kinds. For example, see Elton, Gruber, and Blake [2003].

¹⁹Interestingly, investment managers may similarly respond even when there is no explicit incentive fee. For example, Chevalier and Ellison [1997] examine the implicit relationship between a mutual fund's performance and the flow of investor capital which creates incentives for fund managers to alter the riskiness of the fund's holdings depending upon the fund's year-to-date performance.

²⁰In the context of real estate investments, an example of a conservative action might be signing a lease with a *credit* tenant (i.e., one with low default risk). While such tenants pay lower rental rates, these more creditworthy lease payments are valued using a lower capitalization rate. For property markets operating in equilibrium, executing such a lease should have little impact on the current value of the property. However, such leases tend to decrease the idiosyncratic risk of a given project.

²¹In the context of real estate investments, an example of a risky action might be signing a lease with a *non-credit* tenant (i.e., one with a higher default risk) who is awaiting the resolution of, say, some legal matter such as a patent pending or civil litigation. While such tenants pay higher rental rates, these less creditworthy lease payments are valued using a higher capitalization rate. For property markets operating in equilibrium, executing such a lease should have little impact on the current value of the property. However, such leases tend to increase the idiosyncratic risk of a given project.

²²For an empirical analysis of how governance provisions in the context of venture capital investments—the real estate analogue to value-added and opportunistic investments—tighten (relax) as the investment's performance worsens (improves), see Kaplan and Strömberg [2003].

²³Simplistically, consider the current promote as essentially assured if the conservative action is taken. Meanwhile, there is a 50% chance that the promote will be lost completely and a 50% chance the promote will be, say, doubled (depending on the resolution of the risky matter) if the risky action is taken. In this case, the operator compares the utility of the current promote to the weighted utility value of no promote and twice the current promote. The risk-averse operating partner (i.e., concave utility function with respect to gains) concludes that $Utility(\text{Current Promote}) > 1/2 [Utility(\text{No Promote}) + Utility(\text{Current Promote} \times 2)]$.

²⁴Simplistically, consider the current condition of no promote (i.e., out of the money) as essentially assured if the conservative action is taken. Meanwhile, there is a 50% chance that the promote will remain completely lost and a 50% chance the promote will become in the money, depending on the resolution of the risky matter. In this case, the operator similarly compares the weighted utility values of the possible outcomes and concludes that $Utility(\text{No Promote}) < 1/2 [Utility(\text{No Promote}) + Utility(\text{Promote})]$.

²⁵And its use is not confined to commercial properties. For example, the use of joint ventures can also be found among homebuilders; see Snider et al. [2006].

²⁶Many investors have come to favor this fund management business model (e.g., Kibel et al. [2006] and Kirby [2005]), because, among other reasons, it provides the REITs with the other side of the trade concerning the expected value of the option-like nature of the operator's participation, π .

²⁷This result is not terribly surprising as these sectors are also the two largest in the overall index. Furthermore, the retail joint venture partner often has pre-existing relationships with anchor tenants; such relationships are often viewed as central to the transaction.

²⁸A paired-difference test produced one-sided p values of 5% or less for the total index as well as the office and retail sectors.

²⁹This more-recent sample period is intended to coincide with increased enthusiasm for ventured investments as suggested by Exhibit 14.

³⁰Naturally, one should be cautious about drawing inferences from a small sample. This also extends to the examination of short-term volatility in the relatively tranquil 1998–2006 period.

³¹The volatility figures in columns k through o of Exhibit 15 represent the volatility of the differences in paired returns, not the differences in the volatilities.

³²The use of the Sharpe ratio, which assumes a linear risk-return tradeoff, is inconsistent with the curvilinear risk-return tradeoff for risky debt shown in Exhibit 4. This difference is thought to be fairly minimal for the relatively low-volatility returns found in Exhibits 15 and 16.

³³As noted above, there are substantial differences by property type.

³⁴This result may, at first, seem counterintuitive to the improved performance differential in the more-recent period (i.e., 0.26 versus 0.30). However, it is important to note that the differential in the entire time period is, as a ratio, approximately twice that experienced in the more recent period (i.e., $0.26/0.86 \approx 2 \times 0.30/1.99$).

³⁵Publicly available data on value-added and opportunistic fund performance is quite thin. Kaiser [2005] uses proprietary data to assess the incremental return due to a value-added strategy of a single fund.

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