# Real Estate Investors are Mispricing Risk: Yet One More Reason Why This is a Good Time to Buy Real Estate

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Real estate markets are mispricing risk, systematically undervaluing real estate. Investors who buy now will profit when this mispricing unwinds.

Basic finance theory states that the way in which you finance a venture does not affect its value[1]. As debt is added to the financing structure of an asset, risk is divided between debt and equity, but the overall riskiness of the asset remains unchanged.

If we imagine using an asset's cash flow to fill up a bucket of money from bottom to top, in any particular period of time it will always be more likely that the bottom of the bucket will be filled than the top. Lenders wager that a property will produce enough cash flow to fill the bottom of the bucket to pay for debt service—a relatively safe bet. Equity investors bet that there will be money left in the bucket after debt payments have been "drained" from the bottom. The risk that the entire bucket will fill up remains the same regardless of who receives the money; yet, there are two important properties in the relationship between the risk carried by debt and equity holders:

1. The risk that the entire bucket will be filled can be calculated by adding the small risk incurred by the lender to the large risk incurred by the equity investor. Since debt and equity investors demand a return—or yield—on their investment that is commensurate with their level of risk, it follows that the weighted average of the debt and equity yields should approximate the total property yield.

2. The risks to the debt and equity holders are interdependent. The more cash that needs to be drained to make debt payments, the less likely it is that there will be enough cash left over to satisfy equity holders. Imagine draining two dollars from the bottom of the bucket instead of one. When the debt is small, changing its size has only a small effect on the riskiness of the equity cash flow. Now, imagine that the entire equity payment is made up of only the last two dollars in the bucket. Increasing the debt by one dollar in that scenario means that unless the entire bucket is filled, equity holders will receive nothing. That is to say that when the debt is large, small changes in its size have a large effect on the riskiness of the equity payments.

The argument above indicates that knowing the equity yield required by an investor is meaningless unless one knows the amount of debt involved in the investment. However, what we find in practice is that many real estate equity investors demand a fairly constant yield regardless of the amount of leverage on an asset. One typical strategy is for an investor to determine her required return based on the asset class she invests in. The investor then proceeds to find as much financing as possible in as favorable terms as possible. The larger the loan, the more the equity yield gets boosted (given the same expected cash flows). As long as that yield exceeds the required minimum, the investment is made.

The strategy just described has been one of the reasons why prices have plummeted during the credit crunch. During the boom years of 2004 through 2007, senior debt was available that routinely reached loan-to-value (LTV) ratios around 75%. After including mezzanine and/or other junior debt, total indebtedness commonly reached 90% or more. During those years, hotel investors typically looked for equity yields (also known as leveraged discount rates, or cash-on-cash returns) between 19% and 20%. Total property yields (also known as


## Summary

Real estate markets are mispricing risk, systematically undervaluing real estate. Investors who buy now will profit when this mispricing unwinds. Historical data and examples are presented to support this statement.


1 Comments

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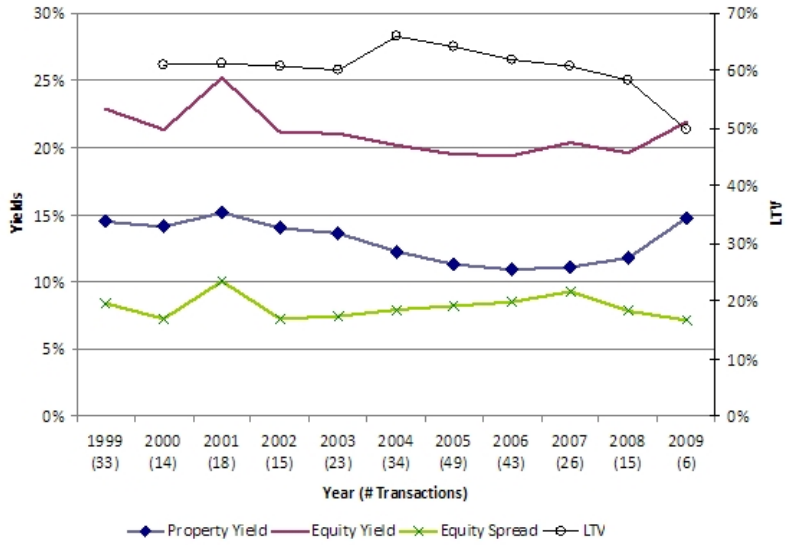
free and clear discount rates, or unleveraged discount rates) hovered around 11%. Since the third quarter of 2008, debt has become much scarcer. Senior debt now is typically constrained by a 50% LTV (calculated off already much lower values), and junior debt is practically non-existent. Meanwhile, many equity investors are still looking for yields in the "low twenties." As the following table illustrates, equity yields actually increased in 2009, despite a steep drop in debt financing. As reduced cash flows are forced to pay higher returns, property values have crashed.

**Figure 1 Historical Relationship Between Equity Yields and Total Property Yields**




Source: HVS (Property and Equity Yields, and Equity Spread); and ACLI (LTVs)

HVS closely tracks transactions of hotels that sell close to the date when they are appraised by the firm. Over the past decade, there were 261 such sales. In these cases, we were able to determine the appropriate equity yield rate by inserting our cash flow projection into a valuation model and adjusting the appraised value to reflect the actual sales price by modifying the return assumptions. The previous chart shows how equity and property yields have trended over the last 10 years. The equity spread represents the difference between the equity yield and the total property yield. The LTV data shown comes from the American Council of Life Insurers (ACLI), and it represents the LTV of new commercial mortgage loans originated by member companies. The trend shown is helpful in understanding the general availability of leverage. However, it understates the extent of the credit crunch for two reasons. First, because the most active and most aggressive real estate lenders during the recent real estate boom were CMBS originators (especially between 2004 and 2007), which are not included in the trendline shown. Second, because it excludes the prevalence of junior debt shops that routinely "topped up" leverage to the 90%+ LTV level during the boom.

What we ***should*** expect to see on the chart above is the following:

- Property yields that fluctuate as the supply and demand for like assets change; otherwise, relatively stable total property yields, unless there is a fundamental reason why hotels as an asset class suddenly become more or less risky.
- Equity yields that move in the same direction as LTVs. Particularly, when LTVs are high, small changes in LTVs should result in comparatively large changes in equity yields.
- Equity spreads that move in the same direction as LTVs. That is to say that as debt disappears from an asset's capital structure, the equity spread should approach zero, and the equity yield should converge toward the total property yield.

What we ***do*** see on the chart is the following:

- Relatively stable total property yields, except for an upward spike in 2001. Our investor feedback suggests that by late 2000 market players figured there was little upside to cash flow growth and adjusted their yields higher. That increase was prevalent on sales that took place throughout 2001, so it is unrelated to 9/11. We

also see a fairly sharp increase in total property yields in 2009.

- Equity yields generally decreased between 2001 and 2007. It is particularly surprising that this trend prevailed between 2004 and 2007, when leverage progressively became rampant and equity holders undertook a lot of risk.
- Equity yields began to increase again in 2008 and rose more sharply in 2009. This is again cause for surprise, given that equity investors were entitled to cash flows with much lower risk (coming from lower down the "bucket").
- Equity spreads have generally moved in the same direction as the availability of financing. While they have moved in the expected direction, it is notable that such movements have been quite minor; equity spreads have remained predominantly flat.

So, what do these findings suggest about investment behavior? It appears that real estate investors (at least those who invest in hotels) do not sufficiently adjust their expected returns to account for the differences in risk brought about by changes in the amount of leverage used. This behavior would lead to the overvaluation of assets when high levels of leverage are available, and the undervaluation of assets when low leverage is used. By implication, these actions would appear to contribute to the formation of asset bubbles and busts.

The following example will show the extent of the mispricing that can take place when equity yields are not risk-adjusted for leverage. We will consider a hypothetical real estate asset that produces stable yearly $1 million cash flow, adjusted annually by inflation—assumed at 3.0% per year. We will consider three scenarios in which the only difference between them is the amount of debt used to purchase the property. The three scenarios are as follows:

1. A base case with 70% debt financing;
2. An all-cash scenario with no debt financing; and
3. A high-leverage scenario with 85% financing

The first scenario is presented below.

**Figure 2 Base Case Scenario, 70% Debt Financing**

| Total Property | |
|---|---|
| Terminal Cap Rate | 11.0% |
| Transaction Costs | 2.0% |

| Debt | |
|---|---|
| LTV | 70.0% |
| Amortization | 25 |
| Term | 10 |
| Interest Rate | 9.0% |
| Loan Amount | 6,619,000 |

| Equity | |
|---|---|
| Equity Yield | 20.0% |

| Year | Net Income | Debt Service | Discounted CF @ 9% | NI Available to Equity | Discounted CF @ 20% |
|---|---|---|---|---|---|
| 2010 | $1,000,000 | $673,856 | $618,216 | $326,144 | $271,787 |
| 2011 | 1,030,000 | 673,856 | 567,171 | 356,144 | 247,323 |
| 2012 | 1,060,900 | 673,856 | 520,340 | 387,044 | 223,984 |
| 2013 | 1,092,727 | 673,856 | 477,376 | 418,871 | 202,002 |
| 2014 | 1,125,509 | 673,856 | 437,960 | 451,653 | 181,509 |
| 2015 | 1,159,274 | 673,856 | 401,798 | 485,419 | 162,566 |
| 2016 | 1,194,052 | 673,856 | 368,622 | 520,197 | 145,177 |
| 2017 | 1,229,874 | 673,856 | 338,185 | 556,018 | 129,312 |
| 2018 | 1,266,770 | 673,856 | 310,262 | 592,915 | 114,911 |
| 2019 | 13,277,846 | 6,105,596 | 2,579,069 | 7,172,251 | 1,158,359 |
| | | | $6,619,000 | | $2,836,929 |

| | |
|---|---|
| Value of Debt: | $6,619,000 |
| Value of Equity: | 2,836,929 |
| Total Property Value: | $9,455,929 |
| Total Property Yield: | 13.2% |

Notice that we have taken the total property cash flow—on the left—and divided it into a debt and equity component. This is analogous to the bucket example we presented earlier. For example, in 2010, the property is expected to produce total cash flow of $1 million. From that total bucket, $673,856 is drained for debt payments, and $326,144 is left to compensate equity holders. The tenth year, 2019, includes the proceeds of an expected reversionary sale of the asset at the end of its holding period, and the repayment of the loan balance

outstanding at the time of sale.

The lender will invest $6.6 million in exchange for the right to collect $673,856 annually, plus repayment of any unpaid balance at the end of the tenth year. It can be seen that the value to the lender of the discounted cash flows in the debt column is $6.6 million, equal to the debt amount.

The equity holder will have the right to the cash flows shown under the equity column. Using a 20% discount rate, these cash flows will be worth $2.8 million to the investor. Hence, the value of the property can be calculated at $9.5 million by adding the value of the debt to the value of the equity.

In the second scenario, we assume that debt financing is unavailable.

**Figure 3 All-Cash Scenario, 0% Debt Financing**

| Total Property | |
|---|---|
| Terminal Cap Rate | 11.0% |
| Transaction Costs | 2.0% |

| Debt | |
|---|---|
| LTV | 0.0% |
| Amortization | 25 |
| Term | 10 |
| Interest Rate | 9.0% |
| Loan Amount | 0 |

| Equity | |
|---|---|
| Equity Yield | 20.0% |

| Risk-Adjusted Equity | |
|---|---|
| Equity Yield | 13.2% |

| Year | Net Income | Debt Service | Discounted CF @ 9% | NI Available to Equity | Discounted CF @ 20% | NI Available to Equity | Discounted CF @ 13.2% |
|---|---|---|---|---|---|---|---|
| 2010 | $1,000,000 | $0 | $0 | $1,000,000 | $833,333 | $1,000,000 | $883,392 |
| 2011 | 1,030,000 | 0 | 0 | 1,030,000 | 715,278 | 1,030,000 | 803,793 |
| 2012 | 1,060,900 | 0 | 0 | 1,060,900 | 613,947 | 1,060,900 | 731,367 |
| 2013 | 1,092,727 | 0 | 0 | 1,092,727 | 526,971 | 1,092,727 | 665,466 |
| 2014 | 1,125,509 | 0 | 0 | 1,125,509 | 452,317 | 1,125,509 | 605,504 |
| 2015 | 1,159,274 | 0 | 0 | 1,159,274 | 388,239 | 1,159,274 | 550,944 |
| 2016 | 1,194,052 | 0 | 0 | 1,194,052 | 333,238 | 1,194,052 | 501,301 |
| 2017 | 1,229,874 | 0 | 0 | 1,229,874 | 286,029 | 1,229,874 | 456,131 |
| 2018 | 1,266,770 | 0 | 0 | 1,266,770 | 245,509 | 1,266,770 | 415,030 |
| 2019 | 13,277,846 | 0 | 0 | 13,277,846 | 2,144,446 | 13,277,846 | 3,842,938 |
| | | | $0 | | $6,539,306 | | $9,455,866 |

| | | |
|---|---|---|
| Value of Debt: | $0 | $0 |
| Value of Equity: | 6,539,306 | 9,455,866 |
| Total Property Value: | $6,539,306 | $9,455,866 |
| Total Property Yield: | 20.0% | 13.2% |

In this case, the entire net income of the property flows to the equity holder. However, we see that if the equity investor uses an equity yield (or free and clear discount rate) of 20%, as before, the value of the property decreases to $6.5 million, a 31% difference from the first scenario. But, since there are no payments to make before the equity investor receives her cash flow, the risk involved is a lot lower. In this case, since the overall risk of the property has not changed, the adequate risk-adjusted equity return should be 13.2%, equal to the total property yield in the first case.

The 13.2% equity yield would be the right figure to use *if debt were available* in the market, but the equity investor *chose* to fund the entire project on her own. In an environment in which *no debt* was available, we would expect the property value to be lower because there would be fewer investors with the wherewithal to make an all-cash bid. Fewer bidders, and the expectation by those fewer bidders that there would be fewer bidders, would undoubtedly result in lower bids and a lower value.

At this juncture, a sophisticated cash-rich equity investor might ask at what rate she would be willing to lend herself 70% of the acquisition price. A 9.0% interest rate would, of course, result in the same value as for the base case. Even if we considered a higher rate, of say 12.0%, the risk-adjusted value of the property would be $8.7 million. This value would represent a 14.7% total property yield and an 8.1% decrease in value compared to the base scenario—much smaller than the 31% calculated earlier.

The high leverage scenario is presented below.

**Figure 4 High Leverage Scenario, 85% Debt Financing**

| Total Property | |
|---|---|
| Terminal Cap Rate | 11.0% |
| Transaction Costs | 2.0% |

| Debt | |
|---|---|
| LTV | 85.0% |
| Amortization | 25 |
| Term | 10 |
| Interest Rate | 9.0% |
| Loan Amount | 8,887,000 |

| Equity | |
|---|---|
| Equity Yield | 20.0% |

| Risk-Adjusted Equity | |
|---|---|
| Equity Yield | 39.4% |

| Year | Net Income | Debt Service | Discounted CF @ 9% | NI Available to Equity | Discounted CF @ 20% | NI Available to Equity | Discounted CF @ 39.4% |
|---|---|---|---|---|---|---|---|
| 2010 | $1,000,000 | $904,752 | $830,048 | $95,248 | $79,373 | $95,248 | $68,316 |
| 2011 | 1,030,000 | 904,752 | 761,512 | 125,248 | 86,978 | 125,248 | 64,433 |
| 2012 | 1,060,900 | 904,752 | 698,635 | 156,148 | 90,363 | 156,148 | 57,616 |
| 2013 | 1,092,727 | 904,752 | 640,949 | 187,975 | 90,651 | 187,975 | 49,748 |
| 2014 | 1,125,509 | 904,752 | 588,027 | 220,757 | 88,717 | 220,757 | 41,904 |
| 2015 | 1,159,274 | 904,752 | 539,474 | 254,522 | 85,239 | 254,522 | 34,653 |
| 2016 | 1,194,052 | 904,752 | 494,930 | 289,300 | 80,738 | 289,300 | 28,251 |
| 2017 | 1,229,874 | 904,752 | 454,065 | 325,122 | 75,613 | 325,122 | 22,772 |
| 2018 | 1,266,770 | 904,752 | 416,573 | 362,018 | 70,162 | 362,018 | 18,187 |
| 2019 | 13,277,846 | 8,197,677 | 3,462,787 | 5,080,169 | 820,476 | 5,080,169 | 183,049 |
| | | | $8,887,000 | | $1,568,310 | | $568,929 |

| | | |
|---|---|---|
| Value of Debt: | $8,887,000 | $8,887,000 |
| Value of Equity: | 1,568,310 | 568,929 |
| Total Property Value: | $10,455,310 | $9,455,929 |
| Total Property Yield: | 11.5% | 13.2% |

In this case, both the debt and the equity cash flows are riskier than in the base case. Both the debt and the equity holders should demand higher rates to compensate for their risk. If they don't, the same property that before was worth $9.5 million would be valued at $10.5 million and the total property yield would decrease from 13.2% to 11.5%, despite the fact that no inherent change in the riskiness of the asset has occurred.

For comparison, we see that if 9.0% were the appropriate debt yield, one would have to increase the equity yield to 39.4% in order to appropriately adjust for the increased equity risk. That is the equity yield that would equate the total property yield back down to the original 13.2% (and the property value to $9.5 million).

In practice, the lender would have to adjust its interest rate to account for the riskier, larger loan. While keeping the 13.2% total property yield constant, a new balance could be struck, for example, using a 10.0% interest rate (an 11.0% increase over the original 9.0% rate) and a 23.4% equity yield (a 17.0% increase over the original 20.0% yield). It would make sense for the equity yield to increase by a greater proportion since the equity risk would increase more than that of the debt.

When valuing real estate, especially at times when LTVs increase or decrease rapidly, equity investors would be better served to derive the appropriate total property yield by looking at the unleveraged yields offered by other investments of similar risk. Given the right total property yield, investors could then determine the appropriate return for their equity depending on the leverage used.

The equity yield trends we presented earlier suggest that investors are not appropriately adjusting their returns to account for the lower risk involved with lower leverage investments. The valuation examples we presented showed that not making these adjustments can significantly undervalue assets at times when debt financing is not available. We anticipate that the mispricing of risk that is taking place now will abate eventually, but not because we expect all investors to suddenly change their behavior. We believe it more likely that when leverage returns to the market, it will correct the mispricing that is currently taking place while equity investors keep their required yields relatively constant. In the meantime, there continues to be a wide bid/ask spread for real estate assets, with many sellers not willing to accept the prices buyers are willing to pay. There is an opportunity for savvy, cash-rich equity investors who risk-adjust their yields to make some great investments.

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[1]This is consistent with the Modigliani-Miller Theorem, which states that capital structure choices are irrelevant to a firm's value. This basic principle has been subject to subsequent refinements and its applicability is reduced when markets are not perfectly efficient, but for the most part the general idea holds true. Adjustments include: the tax deductibility of interest payments, which makes debt financing value positive; asymmetric information, agency issues, transaction and bankruptcy costs that generally make debt capital value negative.