Real estate: Alternative no more

July 2012

IN BRIEF

Portfolios invested primarily in the “Big Two Traditionals,” stocks and bonds, have limited levers for reaching required returns without compromising risk objectives. Global private real estate offers a potential solution:

• An investment market too big and established to ignore, offering a wide range of options along the risk/return spectrum.
• Characteristics reflecting both sides of the typical 60% stock/40% bond portfolio, bridging performance between the two.
• Payouts that can grow in line with cash flows, unlike those of fixed coupon bonds, offering the potential for equity-like upside.
• Significant portfolio diversification benefits.
• Inflation sensitivity—without compromising real returns (as with TIPs) or volatility (as with equities or commodities).
• Potential to improve absolute and risk-adjusted pension portfolio performance and the likelihood of closing deficits.
• A wide array of subsectors and geographies that can help investors design diversified portfolios to address their specific investment objectives.

Is the current market environment heralding the realization of a new normal, a new world of uncertainty, heightened volatility and slower growth? Perhaps, but the reality is that investment portfolios focused on the “Big Two Traditionals,” bonds and equities, are forcing investors to compromise—either by sacrificing return for lower volatility or enhancing return at the expense of higher risk.

Real estate may offer a way out. This is why we believe real estate is increasingly being viewed, not as an alternative, but as an essential portfolio component.
On one hand, while Treasuries and other investment-grade bonds still offer lower volatility relative to risk assets, yields are at or near historic lows, prospective returns are less than attractive and mark-to-market returns could even turn negative once the specter of rising rates materializes. On the other hand, while equities may still provide a return premium over bonds (though at 2.9%, S&P 500 returns for the last ten years ending December 2011 are less than inspiring) the current concession in reaching for return is elevated volatility.

The result? Investors are, understandably, actively searching out and investing in potential opportunities beyond the Big Two Traditionals that can deliver when bonds and equities may not—investments that, ideally, do not require the compromises that investors are facing in their Big Two Traditional portfolios.

Global private real estate offers a potential solution. Encompassing a wide variety of tangible investment opportunities, real estate can offer investors “optionality” in a world of uncertainty—that is, the ability to participate in the capital appreciation associated with strong markets and the downside protection of a stable source of income in weak markets. This optionality imbues global real estate with benefits that can accrue to investors across a wide range of economic scenarios.

The following analysis examines the characteristics of global private real estate investments and illustrates the beneficial role these assets can play in addressing pension funding issues. Additionally, it examines how real estate’s broad range of investment opportunities can be used to construct diversified real estate allocations to help all types of institutional investors improve the trade-off between dampening portfolio volatility and enhancing returns.

**A significant market with many ways to play**

The private real estate investment universe is significant; too significant, one could argue, to ignore. Estimates of the size of the market differ from source to source, but the analysis in Exhibit 1 sizes the U.S. total market for real estate equity and debt at $8.2 trillion. Per DTZ Research, as of December 2011, the total global stock of commercial property may exceed $31 trillion, with about $20 trillion investable (i.e., available for investment by private investors).

Investors have multiple ways to access that investment opportunity, each with its own risk/return profile, allowing for the assembly of diversified real estate portfolios designed to achieve specific objectives, whether driven by risk targets, return targets and/or annual income targets.

Exhibit 2 shows a risk/return curve for various real estate investment strategies. Risk estimates are calculated using historical annual returns (to “de-smooth,” thus increasing volatility). Expected returns are based on J.P. Morgan’s long-term return targets for the strategies shown.

Global real estate provides a range of opportunities along the risk/return spectrum

**EXHIBIT 1: TOTAL U.S. REAL ESTATE MARKET ($8.2 TRILLION)**

<table>
<thead>
<tr>
<th>Private (57%) $4.71 trillion</th>
<th>Debt (38%) $3.10 trillion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct real estate $2.4 trillion</td>
<td>Mezzanine $130–$190 billion</td>
</tr>
<tr>
<td>Corporate-owned real estate $2.2 trillion</td>
<td>Commercial mortgages $2.1 trillion</td>
</tr>
</tbody>
</table>

**EXHIBIT 2: GLOBAL REAL ESTATE—LONG-TERM EXPECTED RETURN VERSUS HISTORICAL VOLATILITY (AS OF MARCH 2012)**

- **Higher return**
  - U.S. core-plus
  - Europe value-added
  - U.S. opportunistic
  - China real estate
  - India real estate

- **Higher risk**
  - U.S. core


The above information is provided for illustrative purposes only. Results shown are not meant to be representative of actual investment results. Past performance is not necessarily indicative of the likely future performance of an investment.
Institutional real estate investors have traditionally categorized direct investments along a similar risk/return spectrum, comprised of core, core-plus, value-added and opportunistic real estate.

- **Core** investments are typically limited to higher-quality property with strong income returns and low (<35%) leverage in order to minimize risk.

- **Core plus** generally implies a core mandate with between 40% and 60% leverage to amplify return on equity. However, we should acknowledge that a core plus fund can mean a fund with a mix of stabilized properties and projects that offer value-added opportunities.

- **Value-added** investments usually involve acquiring properties with about 40% to 60% leverage that also offer an opportunity to improve the quality of the asset (i.e., go from secondary-level quality to core) through lease up of vacant space, renovation or repositioning to another use (e.g., converting from office to hotel space). Yield is important, but appreciation is emphasized.

- **Opportunistic** investing, the riskiest flavor, involves either developing new property or buying existing assets at steep discounts before repositioning (like value-added) to create value gains that will significantly outstrip the contribution of yield.

We highlight these three “step ups” in return and risk as we believe it is more appropriate to think about risk/return characteristics within ranges. Those ranges—denoted by the area of the shaded ovals in Exhibit 2—increase as you go from core to core plus to value-added to opportunistic.

**Side 1 of the debt/equity coin: A stable, bond-like yield**

In terms of total return, real estate has historically delivered performance that falls between equity and bonds (Exhibit 3), a return that is, however, underpinned by stable, bond-like yields. Exhibit 4 compares the actual or targeted long-term yields for stabilized U.S. private real estate to yields for other investments, including investment-grade bonds and equities. The yields offered by real estate are attractive, particularly relative to those of investments with lower levels of risk (investment-grade bonds). It is only by moving aggressively up the risk curve to, for example, high-yield bonds, that investors will find higher absolute yield levels.
Real estate’s low volatility cash flow offers support for stable total returns

EXHIBIT 5: REAL ESTATE APPRECIATION AND INCOME RETURN COMPONENTS (5-YEAR ROLLING, ANNUALIZED, THROUGH MARCH 2012)

Furthermore, investors can have confidence that these yields are reliably stable. Exhibit 5 depicts the yield from core real estate over time. There are two key takeaways: First, the real estate yield for stabilized property has remained remarkably strong over time with no significant declines, even over periods of market stress. Many aspects of the property business lend themselves to yield generation. Tenants often lease space with multi-year contracts that lock in rates and may even allow for periodic increases in the rent over the life of the contract. While there is idiosyncratic risk associated with a single property investment—e.g., a large tenant suddenly goes bankrupt or a persistent decline in the attractiveness of a property’s neighborhood results in secular declines in market rental rates—a multi-property portfolio can largely diversify away such risk. A diversified portfolio will span property types and geographies. This serves to stagger lease renewals (i.e., thousands of leases across a portfolio will come up for renewal at different times, ensuring that at no time is an exceedingly large percentage of the portfolio space at risk of going vacant) and diversify the sources of rental income across tenants employed in a variety of industry sectors. The result is a portfolio that can be relied on to generate a relatively defensive income return across multiple economic backdrops.

The second takeaway is that appreciation is also relatively stable, with only two periods over 34 years in which negative appreciation was sufficient to overcome the current yield, thus resulting in negative total returns. In fact, as with bonds, it is real estate’s yield that helps offset price declines. Exhibits 6A and 6B demonstrate that, on average, over periods when annualized five-year price returns for private real estate have been negative, income returns have been strong enough to offset those losses and generate positive returns. We have shown two examples, one of which compares U.S. real estate to U.S. stocks and bonds, and...
another that compares, over a shorter time frame, U.S. and U.K. real estate to global equities and global bonds. In both cases, in periods of negative price return for the respective asset class, bonds performed best, as would be expected, but equities fared the worst, given their low dividends. Equity investors would have suffered value losses in aggregate. While the amounts do not seem large, note that $100 invested in U.S. direct real estate (Exhibit 6A) over its down periods would have grown, on average, to $110 over a five-year hold; those investing $100 in the S&P 500 over its down periods would have ended up with $94. In a low-return world, that difference, particularly in down markets, is significant.

Side 2 of the Coin: Ability to capture equity-like upside
Real estate returns are underpinned by stable, bond-like yields. However, while bonds pay out a fixed coupon over the duration of the bond itself, real estate payouts can grow in line with cash flow growth. What this means is that during times of trend or above-trend economic growth, the expectations (and reality) of higher inflation and interest rates can put downward pressure on bond and real estate prices, but expectations of cash flow growth can help counteract the impact on real estate valuations.

Credit instruments do, of course, have one tool for resisting price declines in a growth environment—tightening spreads over the risk-free rate—but that’s where the toolkit ends. Real estate valuations can benefit, not only from spread tightening, but also from cash flow growth that can offset inflation-induced increases in the cost of debt and thus in capitalization rates and discount rates. Exhibits 7A and 7B provide direct evidence that bonds will react more directly to interest rate movements, while “growth” assets may not. Exhibit 7A shows a linear relationship between 10-year Treasury and bond yields (i.e., if Treasury yields go up, so do bond yields); this relationship is almost nonexistent between Treasury yields and real estate cap rates (7B).

Once again, one of the reasons for this weak relationship is that even when interest rates go up, if investors anticipate growth in real estate cash flows, spreads are more likely to compress, limiting the impact on values. In Exhibit 8 we find evidence that core real estate cash flow is indeed correlated to GDP growth with a four-quarter lag over the last 20 years. As GDP improves, property cash flows will also generally improve. While the response is lagged, it is likely that investors ultimately start to price in the probability of accelerated cash flow growth, meaning that value growth, thus total returns, may turn up more quickly than the actual cash flow.
This is actually borne out by a simple but noteworthy analysis in Exhibit 9. This study shows that the ability of real estate to grow its cash flow translates into actual returns; real estate, on average, delivers better returns than bonds in higher-growth environments. Since 1978, in years where U.S. real GDP growth exceeded 4%, a proxy for higher growth years, real estate sectors do well, often trailing equities, but in all cases exceeding average returns for those years for U.S. bonds. (Note: While 4% may be a fair cut-off for “high growth” over the period used here, given the continued decline in the U.S. growth rate, trend growth and thus the cut-off for “high growth” may actually be declining.) Opportunistic and Europe value-added strategies did particularly well in up markets, but this should be expected, given their use of leverage. This is a clear manifestation of the “optionality” of real estate investment in all its “flavors,” providing investors—particularly in diversified real estate portfolios—not only a stable yield when growth disappoints, but also the ability to benefit from higher-growth environments.

Real estate returns respond, like equity returns, to economic growth

EXHIBIT 9: AVERAGE ANNUAL RETURNS FOR PERIODS WHEN REAL GDP GROWTH EXCEEDED 4%

<table>
<thead>
<tr>
<th>Percent</th>
<th>U.S. opportunistic</th>
<th>S&amp;P</th>
<th>Europe value-added</th>
<th>NPI</th>
<th>Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>22.2</td>
<td>15.9</td>
<td>14.0</td>
<td>12.4</td>
<td>8.1</td>
</tr>
</tbody>
</table>

Source: Barclays Capital, Standard & Poor’s, NCREIF, Townsend, DTZ, J.P. Morgan Asset Management.


Diversifying agent: More different than the same

After watching correlations “go to 1.00” during the Great Recession, investors are even more keenly aware that there is no perfect diversifier, particularly during conditions as unusual as those experienced in 2008–2009. However, outside of those rare, if damaging, periods, there are asset classes that will more often than not act differently enough to offer ongoing diversification benefits. Real estate delivers that diversification over most periods through two avenues: (1) differentiated return and risk inputs, and (2) differentiated return behavior particularly in down markets, a significant contributor to low correlations, and thus, to diversification benefits over time.

First, the private real estate equity investment universe offers multiple ways to access the real estate investment opportunity. These various investment opportunities come with equity-like total return targets ranging from a competitive 7% to 11% for core/core plus property (gross of fees), to those that are clearly attractive at 14% to 20% for value-added/opportunistic strategies (net of fees). Exhibit 10 attempts to present best estimates of expected returns for bonds, equities and property. Return estimates are based on public sources for bonds and J.P. Morgan proprietary research for equities and U.S. property. (Note: Property returns use appraisal-based internal rates of return levered using current secured debt costs; these are not meant to be indicative of fund performance but of expected

Real estate offers investors a range of competitive and often clearly attractive potential returns

EXHIBIT 10: POTENTIAL RETURN COMPARISON (SPOT OR AVERAGE OF LONG-TERM TARGET RETURN RANGE, AS OF MARCH 2012)

<table>
<thead>
<tr>
<th>Percent</th>
<th>Lehman agg.</th>
<th>Global equities</th>
<th>U.S. equities</th>
<th>RE @ 35% leverage</th>
<th>RE @ 50% leverage</th>
<th>U.S. opportunistic RE (net)</th>
<th>China/India RE (net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2.8</td>
<td>8.4</td>
<td>9.0</td>
<td>8.6</td>
<td>10.8</td>
<td>16.0</td>
<td>18.0</td>
</tr>
</tbody>
</table>

Source: Barclays Capital, MSCI, Standard & Poor’s, Bloomberg, J.P. Morgan Asset Management.

For core and core plus, levered real estate discount rates come from actual acquisition appraisal IRRs (7.47%) and are levered at both 25% and 50% LTV using whole loan mortgages calculated by adding spreads surveyed from our third-party lenders to the current 10-year Treasury on a monthly periodicity (use quarter average of 200 bps). Note: The formula of Bond OAS + 10-year Treasury yield (USGG 10YR Bloomberg ticker) is treated as the discount rate for each bond index, but actual discount rates, especially for high yield and BBB bonds (B221) may be lower due to expected defaults. U.S. stock discount rates are derived from dividend discount rate models of J.P. Morgan Asset Management buy side stock analysts. Other real assets yields are target ranges and averages for those ranges set and updated by J.P. Morgan investment teams for the representative strategies. Note that J.P. Morgan return targets for core and core plus strategies may differ from the estimates of “current” expected returns shown here.
returns given market pricing of unlevered property and commercial mortgage debt). J.P. Morgan strategy-specific long-term return targets (net of fees) are used where necessary. The various real estate investment strategies allow investors a flexible palette from which to construct a real estate allocation that does not require a significant compromise on returns whether sourcing the allocation from existing bond or equity holdings from the typical Big Two Traditionals portfolio.

Additionally, volatility of total returns for most real estate investment strategies is significantly lower than for equities. Utilizing quarterly return series, our analysis in Exhibit 11 demonstrates the relatively stable nature of total returns for a diversified real estate portfolio versus a 60/40 global stock/bond portfolio. Not only are the returns less volatile, but downside volatility is muted with the real estate portfolio suffering negative quarterly returns only 12% of the time, or approximately a third as often as the 60/40 portfolio, which clearly has its tail pulled around by the volatile equity portion of the allocation.

Real estate dances to its own tune...

While investors were disappointed in the performance of their investments during the Great Recession when most, if not all, of the various pieces of their portfolios joined together in an ungraceful (black) swan dive, there is evidence that real estate, more often than not, dances to its own beat, providing a foundation for low correlations and diversification. This appears to be particularly true in weaker markets, including the Great Recession. In Exhibit 12, we show the performance for the 20 worst quarters for a 60/40 U.S. stock/bond portfolio paired with the corresponding performance of private real estate over the same quarters. In 17 of those 20 quarters, while the 60/40 portfolio is down, private real estate generated positive returns, and in only two was the performance worse than -5%. This complements and helps explain Exhibit 11’s conclusion.

Real estate’s low correlation with financial assets, particularly in weaker markets, provides diversification

EXHIBIT 12: TWENTY WORST QUARTERS FOR 60% STOCK/40% BOND PORTFOLIO RETURNS (1Q 1978-1Q 2012)

NFI ODCE is NCREIF index of total return for open-ended U.S. diversified core funds, Wilshire 5000 Index for stock portfolio return, Barclays Capital Aggregate Bond Index for bond portfolio return. Dates represent the ending date of the 20 weakest four quarter periods of the last two decades in the U.S. equity and debt markets through March 2012. Past performance is not indicative of future results. Diversification does not guarantee investment returns and does not eliminate the risk of loss.
Additionally, Exhibit 13 takes a look at how core real estate responded to the market conditions of the Great Recession. While it is true that most, if not all, assets fell together in late 2008 and early 2009, core real estate lagged the rest of the market dramatically due to a lag in mark-to-market pricing. This, in turn, offered investor portfolios a supportive pillar (like Treasuries in this instance) just at the point where other publicly traded assets were plummeting in unison. Real estate ultimately corrected at a time when the typical investor's stock/bond allocation was rebounding; the effect was to assist in smoothing out returns (and AUM) during the downturn and eventual rebound. Furthermore, the real estate rebound began in early 2010 and has only recently really gotten underway per the NCREIF ODCE index. The potential benefit moving forward for investors is that if their stock and bond allocations take a breather from an already dramatic rebound from the bottom, real estate may continue to contribute positively to portfolio returns.

The reality is that diversification may not work in extreme (and thankfully rare) conditions, but it does generally work outside of those truly unusual markets. In more normalized periods, diversification is simply the fall-out from the, hopefully, lowly correlated zig-zags of the various investments held in a diversified portfolio. The challenge for fund managers is to find those asset classes that demonstrate a relatively persistent tendency to zig when other investments zag, particularly in weaker market environments. The evidence is that private real estate is one of those asset classes that, more often than not, is more different than the same. This is the indispensable foundation for low correlations and, thus, diversification benefits over time. Even in an age of cynicism regarding the benefits of asset diversification, real estate deserves serious consideration as a successful diversifying agent.

Real estate: Alternative no more

...and all this is delivered with proven inflation sensitivity

Before entering into any conversation on inflation hedging, it is important to acknowledge: (1) this is a complex topic with many “ifs, ands and buts,” and (2) there are few, if any, investments that can serve as a perfect inflation hedge while, at the same time, delivering attractive risk-adjusted returns. In fact, while TIPS and specific sectors of the commodities markets have proven inflation-hedging capability, the former suffer from expected real returns close to 0%, and the latter (commodities) are often highly volatile. A powerful supportive argument for a private real estate allocation is that property cash flow and valuation offer a heightened level of inflation sensitivity that can contribute meaningfully to a portfolio’s ability to generate returns that meet or beat inflation in most regimes, while exhibiting lower volatility than equities and offering the potential of real returns, unlike TIPS.

The inflation sensitivity of real estate should also be relatively persistent, as that capability is generally supported by structural elements. These elements include clauses in leases and contracts that require annual rent (property) increases linked to inflation and the sensitivity of values to the increases in prices of inputs (e.g., commodities) for the assets themselves, which, over time, supports value appreciation.

Exhibit 9 has already demonstrated the ability of real estate to respond positively, like equity, to economic growth, thus allowing it to offset some of the negative side effects of “growth-induced” inflation and interest rate increases. Exhibit 14 charts historical annual private real estate returns versus CPI over

Real estate proved itself through the economy’s last period of “real” elevated inflation


![Real estate proved itself through the economy’s last period of “real” elevated inflation](image)

Sources: Standard & Poor’s, Barclays Capital (8221), NCREIF, J.P. Morgan Asset Management.
1970–1985, the only period since the early 1900s of sustained, elevated inflation. This period, it could be argued, is the ultimate testing ground for a sector’s inflation-hedging capability. Real estate did very well, while equities (S&P 500) did not.

Investment-grade corporate bond returns managed to exceed inflation by the end of the period, driven by yields that were elevated at the time, a result that is not likely this time around given current yields. It should be noted that for property, the real estate supply and demand cycle does matter: In the period shown, particularly the late 1970s, there was little construction, and landlords were able to raise rents, increase property cash flow, and support total returns that beat inflation. However, in the early 1990s, with exceedingly high levels of supply undermining landlord pricing power, private real estate failed to match inflation.

Currently, supply remains remarkably low and should be supportive of real estate performance and, therefore, inflation sensitivity moving forward. Exhibit 15 shows new supply for the U.S. market as a percentage of the underlying stock (total constructed space) for four property types. The analysis covers three periods of stress, including the three-year periods before and after 1989, 1999 and 2007. The real estate market was clearly overbuilding prior to the bear markets of the early 1990s and the 2000s, but not before the recent downturn. Additionally, new supply has been comparably muted following the crisis in 2008 compared to the other two periods. Finally, additions over 2011 have been even more constrained. All this helps to shore up landlord pricing power even in the face of only incremental demand growth/net absorption.

**Case in point: Pension fund models have spoken**

Many pension plans struggling to improve funded status find themselves confronted by the compromise discussed previously: Maintain low portfolio volatility (to protect assets) or stretch for return (to grow assets). In the current environment of historically low yields on government credit debt and elevated equity volatility, a pension fund manager with investments in only the Big Two Traditionals would have little choice but to increase equities in order to grow assets and narrow the funding gap. This shift, of course, would increase both expected portfolio volatility and, consequently, value at risk. Regardless of funded status, suffering asset declines is devastating, but it may be most damaging for an underfunded pension plan. Such losses are likely to exacerbate the underfunded pension manager’s natural risk aversion—at a time when, facing the uphill challenge of increasing assets, the plan can least afford to be too risk averse.

However, as the following analysis demonstrates, real estate investments, particularly lower-risk core strategies, may offer an attractive solution as a bridge between stocks and bonds, generating income and equity-like returns, but with lower volatility. In fact, our analysis, which looks at several measures of risk of particular importance to pension managers, provides clear support for pension fund allocations to real estate.

**Supply was constrained prior to the 2008 crisis—and continues to be so**

![Exhibit 15A: Additions to Supply in Preceding Three Years Through End of...](source)

![Exhibit 15B: Additions to Supply in Last Three Years Since End Of...](source)

*Data for 2011 is solely for the calendar year.*
Sample pension plan analysis
Our theoretical case study focuses on a pension fund with funded status of 80%: $800 of assets with a duration of 13 years compared to $1,000 of liabilities with a duration of 12 years. The current pension portfolio is allocated 60% to large cap U.S. equities (S&P 500 index) and 40% to long duration government/credit bonds (Barclays U.S. Long Government/Credit bond index).

Using a J.P. Morgan model for analyzing pension fund performance, the analysis compares expected portfolio return/risk measures across four allocation scenarios:
1. Base case: 60% equity/40% bonds
2. 10% unlevered private U.S. core real estate, funded from equity
3. 10% unlevered private U.S. core real estate, funded from bonds
4. 10% unlevered private U.S. core real estate, funded from 50% equity/50% bonds
This last scenario gives a nod to our “optionality” theory of real estate as a beneficial blend of debt and equity performance characteristics.

Measuring pension plan performance
In evaluating the impact of adding a real estate allocation to pension plan portfolios, our analysis looks at both standard risk/return measures (returns, volatility, value at risk, Sharpe ratio), as well as those specific to the management of pension portfolios (surplus volatility and surplus value at risk).

Generating returns to support asset growth while managing volatility to protect asset values is a universal portfolio management objective. Maintaining low portfolio volatility is the key to managing asset value at risk (VaR)—a risk measure used to estimate the probability and scale of potential portfolio losses, based on historical data. Sharpe ratio (the ratio of average portfolio returns in excess of the risk-free rate divided by the standard deviation of portfolio returns) is a well-known metric for assessing risk-adjusted performance.

Pension plans, in addition to managing asset volatility, are also concerned with managing the volatility of funded status—a function of liabilities as well as assets. As readers are no doubt aware, over the past five years, more stringent accounting standards and funding regulations have intensified this concern. Thus, along with portfolio volatility and VaR, our analysis incorporates two additional risk measures of importance to pension managers: “surplus volatility”—the variation (standard deviation) in the absolute value of the pension funds’ surplus (deficit), which can be stated as a percentage of overall assets, and “surplus value at risk” (Pension VaR)—the maximum negative change in the pension surplus that can be expected to occur over one year at a given probability level (e.g., 95%). This calculation considers the expected returns and volatilities of both assets and liabilities.

Risk and return assumptions
Our analysis uses J.P. Morgan long-term capital market assumptions for unlevered core real estate, large-capitalization equities (S&P 500), long-duration government/credit bonds (Barclays U.S. Long Government/Credit bond index) and, for liabilities, long corporate bonds (Barclays Long Corporate A or Higher index). These returns are exclusive of alpha potential, thus are meant to represent only market beta. Additionally, our cash rate assumption is used in computing Sharpe ratios. Volatility measures are based on historical returns (15 years); specifically, core real estate uses a monthly series of levered REIT returns to estimate annualized volatility in order to avoid understating real estate volatility. REIT returns are levered with a weighted-average cost of capital methodology employing the leveraged REIT market returns and returns for unsecured debt.

So, what do pension fund models say about real estate?
Our analysis shows that adding a standard 10% allocation to real estate, funded equally from equity and debt, can enhance portfolio returns on both an absolute and risk-adjusted basis, thus improving the likelihood of shrinking the pension funding gap without significantly increasing asset volatility.

Interestingly, in comparison to the traditional 60% equity/40% bond portfolio, using a standard 10% allocation to unlevered private real estate improves the Sharpe ratio in all three
Adding real estate to an underfunded pension plan can strengthen absolute and risk-adjusted returns while either reducing or maintaining volatility levels.

EXHIBIT 16: RISK/RETURN PERFORMANCE FOR TRADITIONAL 60% STOCK/40% BOND PORTFOLIO VERSUS PORTFOLIO WITH 10% ALLOCATION TO REAL ESTATE (FUNDED FROM EQUITIES, BONDS OR 50%/50% SPLIT)

<table>
<thead>
<tr>
<th>Allocation to Real Estate</th>
<th>Sharpe Ratio (rhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0.44</td>
</tr>
<tr>
<td>5%</td>
<td>0.48</td>
</tr>
<tr>
<td>10%</td>
<td>0.46</td>
</tr>
<tr>
<td>15%</td>
<td>0.47</td>
</tr>
<tr>
<td>20%</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Source: Barclays, NAREIT, J.P. Morgan Asset Management.


Finally, the results from the third scenario, allocating to real estate from both fixed income and equity, are noteworthy in that they support our belief that real estate provides a unique hybrid between equities and bonds. Here, Sharpe ratio improves since the estimated future return for the theoretical fund increases slightly, while volatility comes down strongly. Surplus volatility decreases, though marginally (the decrease muted somewhat by the decline in fixed income/asset-liability matching), value at risk improves and surplus value at risk stays steady. Thus, with no added volatility to funded status, the prospective performance of the portfolio is improved on both an absolute and risk-adjusted basis, consequently increasing the chances of closing the deficit.

It is also worth noting that while we used a consensus 10% allocation to real estate for the analysis shown in Exhibit 16, adding more real estate results in steadily improving Sharpe ratios across all three scenarios considered (Exhibit 17).

It appears that adding real estate for its unique blend of lower volatility and equity-like, but stable, returns does indeed allow investors to reduce portfolio risk without compromising return.

The more real estate, the better

EXHIBIT 17: COMPARISON OF SHARPE RATIOS FOR INCREASING ALLOCATIONS TO PRIVATE REAL ESTATE, FUNDED FROM EQUITIES, BONDS OR 50%/50% SPLIT

<table>
<thead>
<tr>
<th>Allocation to Real Estate</th>
<th>Sharpe Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0.42</td>
</tr>
<tr>
<td>5%</td>
<td>0.43</td>
</tr>
<tr>
<td>10%</td>
<td>0.44</td>
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<tr>
<td>15%</td>
<td>0.45</td>
</tr>
<tr>
<td>20%</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Source: Barclays, NAREIT, J.P. Morgan Asset Management.

Building a diversified real estate portfolio

Historically, institutional investors have turned to real estate for diversification of their traditional financial assets. As in our pension example, for many investors, the first step in this search for diversification has been to invest in U.S. core real estate. Yet increasingly, the sheer variety of well-defined real estate strategies allows access to a more global, diversified set of investment opportunities.

In bringing together multiple real estate strategies within one allocation, the investor can realize diversification benefits within diversification benefits, as the overarching real estate allocation is intended not only to diversify a fixed income and equity portfolio, but also to encompass a group of complementary, but different, real estate strategies. Given the long list of alternatives now available, this diversification of the real estate allocation can be achieved along multiple lines, including style and geography, as well as major investment themes such as income, value and growth.

For example, just as they have long done with their equity allocations, investors can gain exposure to real estate strategies offering different investment styles, including value-added and opportunistic. Strategies can also be selected to deliver global diversification, perhaps by adding a European value-added allocation or a global real estate securities mandate. An allocation to emerging markets through housing, office and infrastructure developments supporting the enormous growth and mass urbanization of developing Asian economies provides exposure to both global diversification and economic growth. While growth is slowing in the developed economies, the emerging markets enjoy more attractive prospects for growth-induced cash flow and price appreciation that should exceed that of developed economies over the mid and long term.

There is no one-size-fits-all real estate allocation

These real estate strategies will generally act differently over time, delivering on different themes. Investors can use these degrees of non-correlation to their advantage in building more diversified allocations to meet their specific objectives.

As Exhibit 18 demonstrates, there is a wide range of real estate categories, each with a unique set of risk/return characteristics. For example, while U.S. core/core plus real estate generates income-driven returns and sensitivity, an allocation to European value-added real estate delivers complementary style diversification (focus on finding upside, i.e., value) and global diversification. As mentioned above, an allocation to strategies focused on, for example, China and India, inject a combination of growth and global diversification that is sorely lacking from the traditional U.S. real estate allocation, even if diversified across different styles. Finally, while U.S. REITs have generated a blend of income and appreciation over time that is in line with a U.S. core real estate investment, an allocation to international real estate securities currently offers value, growth (in Asia) and global diversification.

Real estate subsectors can help investors design thematic solutions for their real estate allocations

EXHIBIT 18: REAL ASSET DIVERSIFICATION CHECKLIST

<table>
<thead>
<tr>
<th>U.S. REAL ESTATE</th>
<th>Income-driven returns</th>
<th>Value</th>
<th>Growth</th>
<th>Inflation sensitivity</th>
<th>Relative liquidity</th>
<th>Global diversification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core/core plus</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Value-added</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Opportunistic</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTERNATIONAL REAL ESTATE</th>
<th>Income-driven returns</th>
<th>Value</th>
<th>Growth</th>
<th>Inflation sensitivity</th>
<th>Relative liquidity</th>
<th>Global diversification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe value-added</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Europe opportunistic</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Greater China real estate</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>India real estate</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REITs</th>
<th>Income-driven returns</th>
<th>Value</th>
<th>Growth</th>
<th>Inflation sensitivity</th>
<th>Relative liquidity</th>
<th>Global diversification</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. REITs</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>International REITs</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
</tbody>
</table>

Source: J.P. Morgan Asset Management.
Diversifying a core-oriented real asset allocation can improve risk/return characteristics

EXHIBIT 19: COMPARISON OF A SAMPLE CORE-ORIENTED U.S. REAL ESTATE PORTFOLIO VERSUS A CORE-ORIENTED REAL ESTATE PORTFOLIO WITH GLOBAL EXPOSURE

RISK/RETURN CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>U.S. real estate portfolio</th>
<th>Globally diversified real estate portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target total return range</td>
<td>8%–9%</td>
<td>9%–10%</td>
</tr>
<tr>
<td>Target income range</td>
<td>4%–5%</td>
<td>3.5%–4.5%</td>
</tr>
<tr>
<td>Historical volatility (annual)</td>
<td>15%–17%</td>
<td>13%–15%</td>
</tr>
<tr>
<td>Sharpe ratio</td>
<td>~ 0.4</td>
<td>~ 0.6</td>
</tr>
</tbody>
</table>

DIVERSIFICATION

<table>
<thead>
<tr>
<th></th>
<th>U.S. real estate portfolio</th>
<th>Globally diversified real estate portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Core/Non-core</td>
<td>75%/25%</td>
<td>62%/38%</td>
</tr>
<tr>
<td>% U.S./Non-U.S.</td>
<td>100%/0%</td>
<td>80%/20%</td>
</tr>
</tbody>
</table>

LIQUIDITY

<table>
<thead>
<tr>
<th></th>
<th>U.S. real estate portfolio</th>
<th>Globally diversified real estate portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative liquidity</td>
<td>Higher</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Source: NCREIF ODCE, NCREIF Townsend, DTZ, Jones Lang LaSalle, JP Morgan GRA Research. Past performance is not indicative of future results. Diversification does not guarantee investment returns and does not eliminate the risk of loss. J.P. Morgan seeks to achieve the stated objectives, but there can be no guarantee the objectives will be met. For illustrative purposes only.

Notes: (1) The return ranges are derived from JPMAM-GRA internal estimates, are net of fees, gross of taxes and inclusive of the strategy-level alpha targets. (2) The historical asset class characteristics are derived from historical annual return series (1992–2011) constructed for each of the respective asset classes. (3) Sharpe ratio assumes a risk-free rate of 2%. (4) 60% of U.S. value-added real estate is assumed to comprise stabilized core properties. (5) The risk/return characteristics are estimates within ranges.

The proof is in the putting

Finally, Exhibit 19 demonstrates that there are concrete benefits to be earned by “putting” other real estate sectors into a real estate portfolio with the objective of building out a diversified allocation. Compared to the typical, diversified real estate portfolio of U.S. core, value-added and opportunistic, a globally diversified portfolio looks better on a number of risk/return metrics, including a significant increase in the Sharpe ratio supported by an increase in target return and decrease in volatility.

A strategic guidepost, not a finish line

It is important to keep in mind that any real assets allocation should be viewed as a strategic guidepost, not a finish line. To be truly effective for the long term, a well-balanced, holistic approach to real estate allocation must be flexible, allowing the allocation to evolve over time based on changing needs, tactical considerations and expanding opportunities.
Real estate: Alternative no more

Conclusion

In a world where the Big Two Traditionals of bonds and equities are forcing upon investors the uncomfortable compromise of accepting historically low returns or elevated portfolio volatility and, thus, increasing value at risk, investors are actively searching out and investing in alternatives that can deliver when bonds and equities may not. Global private real estate investment potentially offers investors “optionality” in a world of uncertainty, an optionality that imbues global real estate with benefits that can accrue to investors across various economic scenarios, avoiding the need to compromise. In summary, real estate total return performance has historically fallen between equity and bonds, while generating yields that are competitive with other fixed income alternatives. However, while bonds pay out a fixed coupon over the duration of the bond itself, real asset payouts can grow in line with cash flow growth, offering the potential for equity-like upside. These attributes result in unique, if not perfect, diversification benefits. And real estate provides a heightened inflation sensitivity—without requiring compromise on real returns (as with TIPS) or volatility (as with equities or commodities). It is not surprising that increasingly investors are coming to the realization that real estate is no longer an “alternative”; it is now an essential consideration for any investor looking for solutions to the challenges posed by a portfolio invested solely in the Big Two Traditionals—stocks and bonds.
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