



Protecting the Value of Real Estate-Rich Portfolios

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I. The Impact of Higher Rates on U.S. Commercial Real Estate and the Economy

Ask Clark Winter about the booming real estate market in the U.S., and the chief global investment strategist of Citigroup's Global Wealth Management division puts it this way: "People invest out of greed and fear -- and U.S. real estate works in both columns." First, greed: Investors across the world are flocking to the U.S. real estate market, lured by rising prices and stories of sudden real estate fortunes. Historically low interest rates and a weak dollar relative to other currencies have created what Winter calls "a wall of money" that is pushing up property values. This in turn has led to a great deal of "blind money" from numerous sources into funds that buy office buildings, shopping malls, multifamily apartment complexes and the like. But many of those same investors are also acting out of fear, disillusioned by the recent poor performance of stocks and bonds, and wary of an uncertain economic outlook.



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That may be as good a take as any on U.S. real estate's recent star turn, but a key factor in the mix has been changing -- that is, of course, interest rates. The benchmark federal-funds rate has risen steadily since June 2004; nevertheless, long-term real estate mortgage rates have remained at attractively low levels. But mortgage rates likely won't stay resilient to rising short-term rates forever, and if mortgage rates do rise, commercial borrowers who haven't locked themselves into low, long-term rates will face higher debt-service bills. Unless they are able to negotiate higher rents, the value of their properties will fall.

Perhaps more so now than in the recent past, the fate of the U.S. real estate market hinges on the behavior of interest rates. And while predicting the movement of interest rates is a notoriously difficult endeavor, investors in real estate would do well to understand the market forces at work in the sector, according to experts at The Citigroup Private Bank, a provider of wealth-management services for high net worth clients, and faculty at Wharton. Moreover, recent research from Wharton illustrates how an overheated real estate market, coupled with rising rates, can have a dire impact on a country's banking system and economy at large.

The Disconnect from Fundamentals

Don Alexander, fixed-income strategist at Citigroup Global Wealth Management Macroeconomic Research, says that although interest rates likely could rise in the first half of 2006, the end of the Federal Reserve tightening cycle appears to be in sight. For one thing, the effect of the recent spike in crude-oil prices on core inflation should be limited, he says, since countries are more energy efficient now than they were in the 1970s. A tight labor market would justify further Fed tightening in the short term, but Alexander also notes that inflation tends to ease as the job market weakens and growth moderates. "Our base case is for economic growth of 3.3% for 2006, with growth moderating by mid-year. As the economy starts to weaken, the Fed could start to cut rates, and we could see the 10-year bond yield actually decline from the current level."

Even so, commercial real estate investors would do well to be wary of higher interest rates. That's because if interest rates do rise, they would carry a potential "double whammy," according to Damian Kozlowski, CEO of The Citigroup Private Bank. First, higher interest rates would make the U.S. dollar stronger, choking off the flow of funds from foreign investors into U.S. real estate. Second, U.S.-based investors would obviously find it more difficult with costlier debt. "A strengthening dollar and more-expensive local real estate markets could lead to a significant correction in real estate prices," Kozlowski says.

Indeed, for much of the real estate run-up in the U.S., values have not been accompanied by corresponding increases in the quality of returns from properties, creating a disconnect between asset prices and their underlying fundamentals. A property investor's net operating income (NOI) -- or income after local property taxes and operating expenses are deducted -- is the spread between the rents they are able to charge and the cost of their capital, including debt service. "Property values are rising, but we are not seeing NOIs rise as rapidly," says David Rosenberg, head of U.S. investment solutions for The Citigroup Private Bank. His group oversees client investments of about \$15 billion across the U.S. Investors weigh NOI as a percentage of a property's price to derive the capitalization rate, the indicator most commonly used to express value. (The higher the cap rate is, the less expensive the property is, assuming unchanged rents.) While he sees that vacancy rates are decreasing from their recent peaks, value growth has outstripped NOI increases -- an indication that investors are settling for lower risk-premiums when buying real estate today compared with a similar point in other real estate cycles. Even as he spots exceptions in some markets where rents could rise, he finds others, like shopping malls, "extremely expensive and frothy."

Rosenberg says many real estate investors think that they are hedged against a rising interest-rate environment -- a notion that's only partially true at best. Real estate acts as an inflation hedge, given fixed-rate mortgages and the ability to pass many operating expenses along to tenants. "But one must remember that as interest rates increase, economic activity often weakens. That makes it harder to push rents higher and find new tenants to replace old ones," he says.

Ripples beyond the Real Estate Market

Such a turn in the market could have important effects far beyond the real estate market, according to a recent research paper by [Susan Wachter](#), Wharton professor of real estate and finance, and Andrey Pavlov, professor of finance at Simon Fraser University in Burnaby, British Columbia. In their spring 2005 paper titled, "Real Estate Crashes and Bank Lending," published in the *Wharton Real Estate Review*, they say bankers chasing market share and compensation bonuses tend to underprice risk in a systemic fashion with potentially disastrous consequences.

Wachter and Pavlov explain that all non-recourse, asset-backed loans imply a put option on the underlying asset, which essentially allows the lending institution to acquire the asset in case of defaults or delinquency. But in a fiercely competitive marketplace, short-term-oriented lenders might underprice the put option to gain business. They feel emboldened also by the cover of deposit insurance and limited liability in the event of a market crash. The authors say that as short-term-oriented lenders resort to such underpricing, it becomes "impossible for correctly pricing banks to compete, as other lenders are forced into underpricing, regardless of whether they are focused on short-term profits or on long-term performance."

Wachter and Pavlov say that scenario could create crises beyond the banking system or the real estate industry. They contend that as such systemic underpricing narrows the spreads between lending and deposit rates, it also has the effect of pushing asset prices above fundamental levels, both of which erode lenders' long-term profits. "The increase in asset prices is the most troubling," they say, "because of the implications for macroeconomic stability." They add that inflated real estate prices induce a construction boom and an inefficient allocation of resources within the economy.

Here is how the authors visualize the next stage: "With levered real estate, asset price declines below mortgage value will induce defaults. At the same time, the loss in asset value will decrease the value of bank collateral. Both effects have the potential to undermine the banking system's financial soundness, as has been shown repeatedly in numerous banking crises that have accompanied real estate crashes."

Three years ago, in fact, Wachter and Pavlov showed formally for the first time the conditions under which the chase for increased profits in good times led to underpricing risk. Their paper, "Robbing the Bank: Short-term Players, Debt Market Competition, and Asset Prices," investigated the market prices of assets in fixed supply whose purchase was typically financed by non-recourse loans, as in the case of real estate. They also pointed to real estate crashes in the 1990s throughout Asia and found that asset-price declines were sharper and deeper in Thailand, Malaysia and Indonesia, where the governments did not exercise strong controls over lenders' conduct. But Hong Kong and Singapore escaped with much lower property price declines -- although they were substantial at 33% and 38%, respectively -- because government regulators in those countries stepped in to prevent underpricing. The authors' warning: "If banks are not correctly pricing risk, they are producing risk."

Finding Opportunity in Risk

Wharton real estate professor [Todd Sinai](#) believes that the risks are overstated when it comes to real estate, especially the idea that a bubble will burst with higher interest rates. "Real estate interest rates don't always rise in a vacuum," he says. "They go up when economic growth is heating up." High net worth commercial investors, in particular, are not as leveraged as people at the lower end of the housing market, he adds. "They have more equity in their investments. They currently have a lot of money and no [other] place to put it."

Todd Thomson, chairman and CEO of Citigroup Global Wealth Management, offers a bird's-eye view of real estate investing. He oversees The Citigroup Private Bank, Smith Barney and Citigroup Investment Research, which have client assets of \$1.3 trillion and a network of 26,000 employees across 600 offices worldwide. According to Thomson, real estate cannot be treated as a single asset class, and distinctions are sharp between the office, industrial, residential and retail spaces. He says real estate is not a national market like that of a GE stock that trades at one price, but is "very much a local game." Those factors, combined with the relative inefficiencies of real estate as an asset class, make it possible for smart investors to find pockets of profitable opportunities. It's also not easy to say when one is overpaying for real estate. Referring to the New York City commercial real estate market, Thomson says "investors felt there were high prices for real estate two years ago, one year ago and feel the same way today."

Stephen Coyle, chief investment strategist at Citigroup Property Investors, is particularly bullish on the U.S. office, industrial and hotel sectors over the next three years. "Right now, we are at a national vacancy rate of 13.6% in the office markets," he says. "That's about the point where rents start to rise." Coyle adds he has "a hard time getting excited" by opportunities in the multifamily housing market, which historically has been the least volatile market and therefore draws investors in hordes. He says that one plus for the sector is that if interest rates rise, homeownership levels will fall, resulting in increased occupancy levels for multifamily properties. "But they don't get pricing power," he warns. He says capitalization rates -- the relationship between the income stream from a property and its present value -- for multifamily properties are very aggressive, currently 4.9% on average, according to the property index compiled by the National Council of Real Estate Investment Fiduciaries.

Despite the compounding warnings about a potential crisis in real estate, [Peter Linneman](#), professor of real estate, finance and public policy at Wharton, is convinced the economy is on "a strong and sustainable" growth path. "We just went through a horrible economy, a horrible meltdown, and the real estate returns were great," he says. "Tenants will pay their rents before they pay their lenders because if they don't, they will get thrown out of their space."

Linneman feels that those who do nothing more than buy cash streams can't reasonably expect big returns. "Are you taking a company out of bankruptcy, are you redeveloping some property, are you getting entitlements to property faster than somebody else, did you take the risk of getting entitlements?" he asks. But he cautions that such plays are not for everybody, and that half of the battle is picking the right horse. "There are probably 120 opportunity funds out there in real estate, and 12 or 15 of them are worth being in," he says. "The trick is identifying them and getting access, because some of them aren't taking money from new investors."

Citigroup's Thomson says the best avenues for real estate investing are in value-added deals involving the redevelopment or restructuring of an existing space, as opposed to just another property. All the same, he stresses the need for an asset-allocation strategy that counts real estate among many components. "It's time to reassess your allocations, but I would stay invested in real estate to some degree," he says. "You have to start with the right asset allocation and make adjustments from there."

II. Circling the Globe for Real Estate Opportunities

This is the second part of a three-part report; read parts [one](#) and [three](#), or download a [pdf version](#) of the entire report.

Given the potential impact of higher interest rates on U.S. real estate, many high net worth investors are increasingly looking for opportunities in other countries. According to Wharton's [Peter Linneman](#), sophisticated investors began looking more seriously at offshore real estate opportunities five years ago. In a 2001 research paper titled, "International Real Estate Investing," he noted that real estate was occupied by a rapidly globalizing tenant base and financed by capital sources that were increasingly international and integrated. "The attractions of international real estate investing are both obvious and alluring," he wrote. "Perhaps as much as 60% of investment-quality real estate lies outside the U.S."

Cut to the present, and there is evidence all around that the current real estate boom has gripped investors from Sao Paulo to Shanghai. Clark Winter, chief global investment strategist at Citigroup Global Wealth Management, says it's getting easier to secure legally enforceable titles to property in many countries in Latin America, Eastern Europe and Asia -- something that didn't exist in earlier years. That has coincided with easier access to credit and equity flows fueled by robust economic growth. Winter recalls how London was one of the first recipients of global investors' real estate capital after it opened up in the post-Thatcher years. To identify similar opportunities, experts from Wharton and Citigroup note, investors need to develop a real, local understanding.

Global Real Estate Isn't So Global

In the fall 2004 edition of the *Wharton Real Estate Review*, Jacques Gordon, global strategist at Chicago-based LaSalle Investment Management, cautioned against using the word "global" too broadly for real estate. "There is little that is 'global' about the world of international real estate," he says. "This is not a world that treats all 197 countries tracked by economists at the United Nations, the World Bank, the OECD and the IMF as equally eligible investment targets." Gordon says the capital willing to flow into real estate comes mostly from eight to 10 countries and is headed for no more than 20 or 25 countries. Research by LaSalle Investment Management's parent, Jones Lang LaSalle, identified the principal origin countries for real estate capital in 2002 to 2004 as Australia, Canada, Germany, countries in the Middle East (including Israel and oil-exporting Arab states), the Netherlands, Singapore, the U.K. and the U.S. The target countries, however, represented 80% of the world's gross domestic product.

What are the obstacles? First, the trend toward legally enforceable titles has only just begun. Indeed, lack of transparency and the inability to secure property rights still get in the way of real estate capital going to many emerging markets, Gordon says. Also, many local real estate practices show relatively few signs of "convergence" despite the pressures of globalization. "Lease contracts, mortgage instruments, and regulatory and tax regimes remain deeply rooted in country-specific traditions, notwithstanding the growing trend of cross-border investing and the advent of multi-country trade blocs," he says.

Gordon acknowledges that transparency regarding the nature of these differences is rising, but country-specific real estate practices remain closely tied to long-held institutional frameworks. Gordon lists some of these: the Civil Law versus Common Law approach to property rights; tenant-friendly versus landlord-friendly approaches to lease contracts; and local standards applied to building and zoning regulations.

Wharton real estate professor [Grace Wong](#), who has studied the housing market in Hong Kong, particularly the bubble during the mid-1990s, emphasizes the difficulty of unraveling the elements that affect real estate pricing in the global market. Wong's analysis of the Hong Kong bubble -- which saw a 50% increase in housing prices between 1995 and 1997, and then a 57% decrease between 1997 and 2002 -- shows that even the usual suspect -- interest rates -- had little to do with the initial rise in home prices. It also wasn't a simple supply-side story, according to her analysis. "The literature of speculation has been limited by the difficulty of measuring fundamental values of assets," she writes in a working paper titled, "The Anatomy of a Housing Bubble." "This difficulty is exacerbated in housing studies because of the structural heterogeneity of the housing stock, low transaction frequency, and the importance of geographical location and local institutions (e.g., zoning laws) in determining housing values."

Sweet Spots amid Uncertainty

Stephen Coyle, chief investment strategist at Citigroup Property Investors, sees some "sweet spots" amid all this uncertainty. For instance, he finds the western German residential market to be "interesting" and says Citigroup is active there. "Properties are being sold for 80 cents on the dollar at today's values, which is up from 70 cents on the dollar six months to a year ago and 50 cents on the dollar three years ago," he says. "The problem is, if you buy a portfolio, you

are going to have some eastern German exposure, and you want to limit that." He also sees openings where others see problems: "The lack of transparency in Europe creates a lot of opportunity, especially as corporations and governments sell off non-strategic real estate as part of the 'Great Exchange' from users to investors." And he warns investors to stay away from markets that lack a clear financial infrastructure.

Coyle says his team is spending a lot of time scouting for opportunities in China, India and Japan. He's upbeat on Japan, especially with the recent recovery in its economy. He also expects "a ton of assets" heading for sale after February 2006, when a new law will take effect requiring corporations to price their assets at fair market value. "You are going to see more and more assets brought to market on behalf of corporations, not just government-owned stuff," he says.

Earlier this year, India enacted laws that make it easier for foreigners to invest in construction and real estate, and the country has worked on streamlining master planning and zoning. "We're particularly excited about the Indian market, especially with the recent policy changes and the general growth we expect to see happening there in the office and retail space," says Todd Thomson, chairman and CEO of Citigroup Global Wealth Management. Other markets on his radar include the Ukraine, where he expects a turnaround, as well as Poland and Hungary.

Bulls in China

Another China bull is Quek Kwang Meng, who heads real estate investment for the Asia-Pacific region at The Citigroup Private Bank for clients in Hong Kong, China, Singapore, Thailand, Malaysia, the Philippines, India and the Middle East. "Asian investors are wary of interest rates, but the dynamics are different in this region because of the huge growth in demand, and there is a shortage of supply," he says. He points to Shanghai, for example, a city of about 18 million people where the annual supply of 200,000 housing units is equivalent to the whole of Australia. China's rapid growth is fueling a large migration to cities from rural and suburban areas. Wages in China are rising 15% to 20% annually, and people need housing.

In the June 15, 2005, edition of *The View*, the monthly investment publication from The Citigroup Private Bank, chief global investment strategist Winter wrote: "China's needs are so great -- 400 new airports, according to the nation's state planners, more than 500 large power stations, dozens of new port facilities,

thousands of miles of railroads and highways -- that the bill could easily run into hundreds of billions of dollars." He noted that dollar flows into the country would accelerate, also because of the need for oil, cement, steel and food "in the increasingly well-fed nation."

Quek says real estate developers in China are raking in returns of more than 20% on their investments, and Hong Kong's property prices are up 120% from 2003. He now feels emboldened to launch a few real estate funds. Several large developers have floated their own funds in an attempt to distribute risks and enhance their ability to take on large projects.

Quek isn't worried about the market risks should interest rates rise, mainly because of the Chinese government's clampdown on speculative activity. Banks avoid giving loans to people buying their third or fourth house, which also has cooled the market for luxury homes. Elsewhere in Asia, Quek says loan-to-value (LTV) ratios are conservative at 60% to 70%, and governments and banks discourage excessive borrowing. Hong Kong doesn't tolerate LTVs beyond 70%, and Singapore's 90% threshold also keeps debts in check. In addition, Hong Kong and Singapore have no capital-gains taxes, something Quek sees as a big plus for his investors.

Real Assets in Latin America

The real estate investing market is also strong in Brazil, where Jan Karsten is the Latin America head of Investment Counseling for The Citigroup Private Bank. His high net worth clients hold an average of 50% of their portfolio in real estate. Brazilians hold a high portion of their investments in real estate chiefly because it has been viewed as the surest way to protect their net worth against inflation.

Karsten says that despite high exposures to real estate, Brazilian investors hold the rest of their investments in liquid, fixed income instruments, besides private equity and hedge funds. A significant portion of Brazilian investments traditionally has been in Argentina, and that continues with Argentina's robust economy. Karsten says attractive exchange rates also entice U.S. and European investors, especially in agribusinesses and wineries.

Karsten is not worried about interest rates; they are now around 17.25% in Brazil, and "there isn't much room for them to go any higher." Also, 2006 is an election year and Karsten expects interest rates will be lowered given the political mileage such a move would offer.

Real estate is gaining an increasingly larger share of high net worth portfolios in Mexico and elsewhere in Central America, according to Eduardo Dosal, global market manager for The Citigroup Private Bank in Mexico. He says credit is more easily available for real estate owners than it was four years ago, and interest rates have been steadily lowered (about 10% currently compared with the punitive 80% a decade ago). Also, the political and economic stability of the region is improving, which has contributed to investor returns of 20% or more in real estate.

A rise in U.S. interest rates would affect Dosal's markets significantly, especially the dollar-denominated bonds issued by many Latin American governments. He says his investors "have already started asking a lot of questions about private equity deals, and are investing in them." Much of this investment is destined for the U.S.; he says most local Latin American markets don't offer the liquidity or depth in stocks and bonds, let alone options in leveraged buyouts or hedge funds.

Against this backdrop of beckoning offshore markets and changing fundamentals at home, Citigroup executives expect many of their high net worth clients to gravitate toward opportunistic plays in search of higher returns. The Citigroup Private Bank CEO Damian Kozlowski says that as large capital inflows have lifted U.S. property values to uncomfortably high levels, "investors are going down the food chain" to look for other situations they may not have necessarily considered in the past. But with such investing where they don't understand the terrain so well, Kozlowski finds them "less confident that they can make

it work like they did the last time." Clearly, while they are searching for the next pocket of opportunity, they are treading cautiously.

III. A Better Defense for Real Estate-Rich Portfolios

This is the third part of a three-part report; read parts [one](#) and [two](#), or download a [pdf version](#) of the entire report.

Given the prospect of rising interest rates in the U.S. and elsewhere, and the challenges of finding opportunities overseas, many real estate entrepreneurs are looking for ways to protect their portfolios. "Real estate has attracted significant investment, leading to high valuations, and some clients are expressing concerns about the potential for declining values in a rising interest-rate environment," says Marc DiLorenzo, chief operating officer at The Citigroup Private Bank. Indeed, as the threat of rising interest rates to U.S. real estate becomes increasingly real, investors should consider ways to lower their risk exposure, according to experts at Wharton and The Citigroup Private Bank.

Portfolios of Real Estate Entrepreneurs

The Citigroup Private Bank's typical high net worth client has a net worth of at least \$25 million, and many have made their fortunes in real estate, according to CEO Damian Kozlowski. They are typically entrepreneurs, real estate developers and financial sponsors like private equity firms. The Citigroup Private Bank's clients tend to concentrate their investments in a single asset class. "We build our business around that investment behavior," he says.

What's in a typical real estate client's portfolio? Three things, according to Kozlowski: *concentration* (relatively few asset types make up a large proportion of net worth); *correlation* (those holdings tend to behave similarly); and *illiquidity* (investments are locked up for many years). "Even when they get out of whatever their primary holding is, they reinvest in assets that behave similarly," Kozlowski says. For example, when entrepreneurs sell their companies, they might reinvest their proceeds in the stocks of the companies they sold to. Also, portfolios' illiquidity makes them too inflexible to allow for quick responses to macroeconomic shifts. Put it all together, and structuring portfolios that have inherently counter-balancing characteristics as responses to so-called "event risks," like interest-rate increases, becomes critical.

Another characteristic of real estate entrepreneurs is the aggressive use of leverage with floating-rate loans. "Historically, if you've been willing to take the risk of playing the short end of the yield curve by taking out consecutive short term mortgages or adjustable rate mortgages, you actually have done better," says Wharton real estate professor [Todd Sinai](#). "But it's riskier. It's not risk-adjusted better, but in a lower, long-term interest rate environment, there's nothing to say that people shouldn't be taking out adjustable rate mortgages."

The Challenges of a Real Estate-Heavy Portfolio

All this doesn't mean that real estate isn't an attractive asset class. David Rosenberg, head of U.S. investment solutions for The Citigroup Private Bank, says real estate will remain an important asset group in his ideal portfolio for high net worth investors because real estate currently offers "reasonable returns, reasonable cash flow and a limited amount of risk relative to other assets." But he also believes that investors need to recognize that real estate is subject to event risks -- such as interest-rate spikes -- and an

absence of symmetry, or a "skewness" in the distribution of returns. "When you invest in real estate with an understanding of that distribution distinction, you are better prepared to diversify around it."

Rosenberg also says investors should pick good managers who provide diversified portfolio offerings, even if the investor is intimately familiar with real estate. "If you are a small investor -- and that includes people with a net worth of \$25 million -- and you want to put, say, 10% or 15% in real estate, you still don't have enough capital to self-select your own portfolio," he says. That's why real estate entrepreneurs should turn to experienced real estate fund managers and adopt an asset-allocation strategy that accounts for real estate's unique characteristics.

However, building such an efficient portfolio presupposes an ability to compare risks and returns across different asset groups. The historical data most widely used in the real estate industry are compiled by the National Council of Real Estate Investment Fiduciaries (NCREIF), a not-for-profit industry association in Chicago. Its members include real estate investment managers, institutional investors, accountants, consultants, appraisers and academicians. At the end of 2004, the index compiled by NCREIF covered 4,152 properties with a market value of \$145.44 billion.

In a 2004 paper titled, "Real Estate Returns in Public and Private Markets," Wharton professor of real estate and finance [Joseph Gyourko](#) points to some limitations in the NCREIF index, especially when it displays an "extremely low volatility" in returns. He notes that the information from the NCREIF series is not transaction-based and "as such, does not represent the true performance of arm's-length trading of properties." In his paper, Gyourko demonstrates that the very low volatility of real estate returns as measured by the NCREIF index reflects measurement error.

That error is rooted in the fact that the index records volatility in capital values only in the fourth quarter of a year. According to Gyourko, "While it is quite reasonable to believe that the net rental flows on a widely diversified portfolio of well-leased, institutional quality properties are very stable from quarter to quarter, the absence of appraisals each period obviously under-represents the volatility of the capital gain component of total return."

Gyourko points to the pitfalls of relying too much on the NCREIF index in the design of investment portfolios, noting that the low volatility of returns leads to "artificially favorable portfolio implications, as the covariance of this real estate series with stocks and bonds is artificially low." In a standard asset-allocation model, he adds, that would have the effect of assigning a significant portfolio share for appraisal-based real estate. But in practice, that is not the way investment managers typically have viewed real estate's place in portfolios. He says that with commercial real estate's share of the investable universe estimated at about 10%, "one does not have to be a committed believer in efficient markets" to conclude that a significantly higher allocation to real estate is too high.

Overcoming Faulty Data

Citigroup has addressed similar concerns over the last several years through its own research, as part of its Whole Net WorthSM asset-allocation methodology. According to Nicolas Richard, head of Strategic Asset Allocation at Citigroup Global Wealth Management, Citigroup has employed a variety of methods to correct several significant shortcomings in the historical data of the returns, risks and correlations of different asset classes. He names some of the technical challenges addressed by Whole Net Worth regarding alternative assets such as real estate: using artificial appraisal valuations for illiquid assets; making the most of short track records; survivorship bias (when investments that have failed to survive during a period under study are excluded from the data examined, skewing the results); and selection bias (when incorrect sampling excludes relevant groups of securities or entities, which again creates misleading results).

Richard and his team try to get around "staleness" in the underlying components of indexed returns.

Staleness occurs in the case of real estate, private equity, distressed debt or other illiquid assets, which do not allow fund managers to provide accurate monthly returns to index providers. The resulting infrequency of valuations creates artificially low volatility in returns. Another imponderable is the so-called "fat tail" risk, where an asset class may not be volatile but still presents significant downside event risk. According to Richard, this could happen "when in one month out of 20 you get really, really bad returns." Only by incorporating all of these characteristics of real estate can you build efficient portfolios and truly understand their risks, he says.

Investment Strategies for Real Estate-Heavy Portfolios

So what strategies should real estate entrepreneurs consider now, given the prospect of rising interest rates in the U.S. and elsewhere? Perhaps the most important strategy is sensible asset allocation. Asuka Nakahara, Wharton real estate professor and associate director of the School's Zell/Lurie Real Estate Center, says high net worth investors make "half their money" as soon as they decide how to allocate their assets. But he also isn't willing to blindly follow the market, saying he wouldn't try to chase "a hot market" just as he would not ignore what many may describe as "a cold market." In today's real estate euphoria, he sees an "eerie similarity" to the dot-com bubble of the late 1990s, "when if you had not bought Internet stocks you would have felt foolish." His simple tip: "You can never make a mistake taking a profit in real estate."

Citigroup's Rosenberg, however, thinks it is critical for high net worth investors to be better prepared for interest-rate shocks. The main plank of his strategy is to design portfolios with assets that have opposite return distributions over a period of time. "According to our research work, what you need are other asset classes that offer investors the ability to buy into a positively skewed distribution," he says. In essence, this means steering clear of negative returns. He says such assets tend to have "equity-like characteristics," examples of which are directional hedge funds and leveraged buyouts. Rosenberg explains that unlike hedge funds that try to cut out all the beta risks, directional hedge funds retain some exposure to the equities market. "Their equity characteristics and their positive exposure to the market give directional hedge funds and LBOs varying degrees of equity exposure, so that gives you a positive skew in the portfolio," he adds.

Rosenberg says these asset groups carry event risks, but historical-return distribution curves show they are positively skewed. While real estate investments could face a negative event risk at some point over a cycle, he says, LBOs could have a positive event risk at some other juncture; over time, the two could cancel out each other. Investors could also dip into a range of derivative products that allows them to trade returns for liquidity and stabilized debt-service obligations.

Rosenberg goes about designing investment portfolios with a keen eye on liquidity. Many high net worth clients come to him with sizable pre-existing real estate or other holdings that may be relatively illiquid, so the challenge is to balance those with instruments that have more liquidity. Of course, a lot depends on the investor's degree of willingness to tolerate illiquidity and other objectives, including safety and growth in value. "Based on the success of many of our real estate entrepreneurs, we do not try to tell our investors what to do," Rosenberg says. "These individuals are among the more independent type of investor out there." Even so, he persuades them to take the excess cash flows from their properties and invest them in assets that diversify their risks.

Ajay Badlani, head of the U.S. Analytical Lab for The Citigroup Private Bank, says one way to mitigate the event risks that real estate investments carry is to include assets in your portfolio, such as equities, that have a low correlation to real estate. The potential downside risk of the portfolio can be diminished further by buying protection, such as put options on equities.

"What's clear is that the more tools investors have at their disposal, the better they can position real estate-rich portfolios," Badlani says.

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