Real Estate Comes of Age

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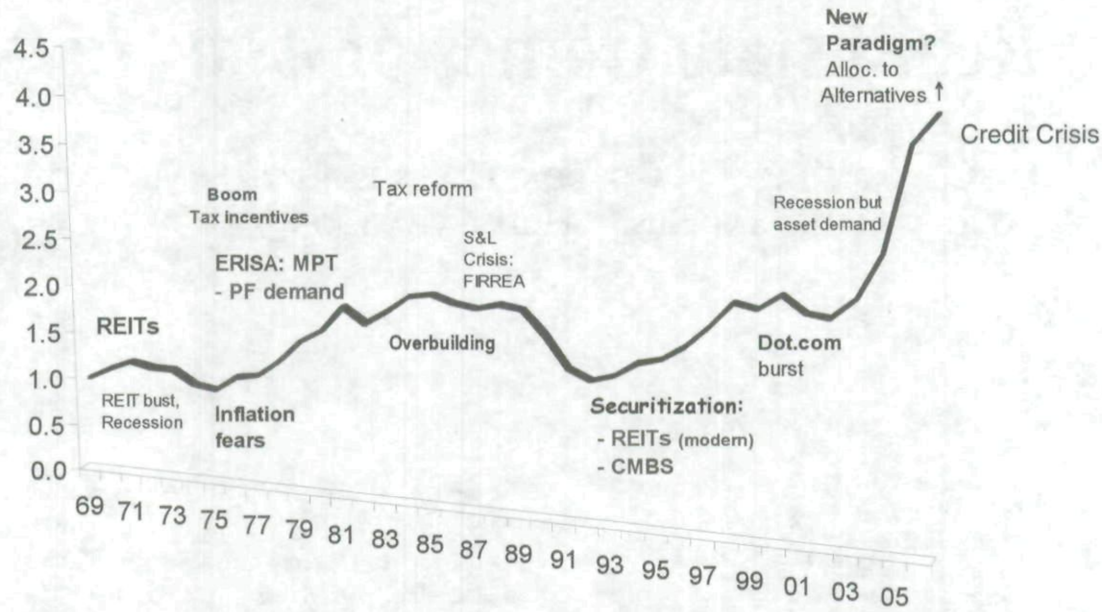
It has been about 40 years since U.S. institutional investors first began investing in commercial real estate. During much of the first two decades real estate suffered from a "Rodney Dangerfield" complex, finding it a challenge to earn widespread respect in the investment community.[1] This has changed dramatically over the past 5 to 10 years. Real estate has gained wider acceptance as a legitimate institutional investment, as it has evolved into a more transparent asset class that continues to grow and integrate with the broader capital markets. Exhibit 1 highlights a number of major episodes and events in the life cycle of pension fund real estate investment in the U.S. from its initial beginnings with the passage of the Employee Retirement Income Security Act (ERISA) by Congress in 1974 to the post dot-com bubble period characterized by strong capital flows into real estate and considerable current debate about the potential repricing of the real estate class as it has matured and become more integrated with broader capital markets.[2] Exhibit 2 reports transaction activity based on properties sold from the NCREIF Property Index (NPI), the primary index used by tax-exempt institutional investors to benchmark core real estate portfolios. The rapid growth in trading volumes, measured both in terms of quantity and dollar value, reflects the surge in capital flowing into the private real estate sector as it has come of age.

One of the most important developments in real estate finance during the 1990s was the emergence of the public capital markets as a funding source for the private real estate sector. The spark for this development was the real estate depression and capital crunch of the early 1990s. The resulting securitization revolution helped produce today's public real estate investment trust (REIT) and

EXHIBIT 1

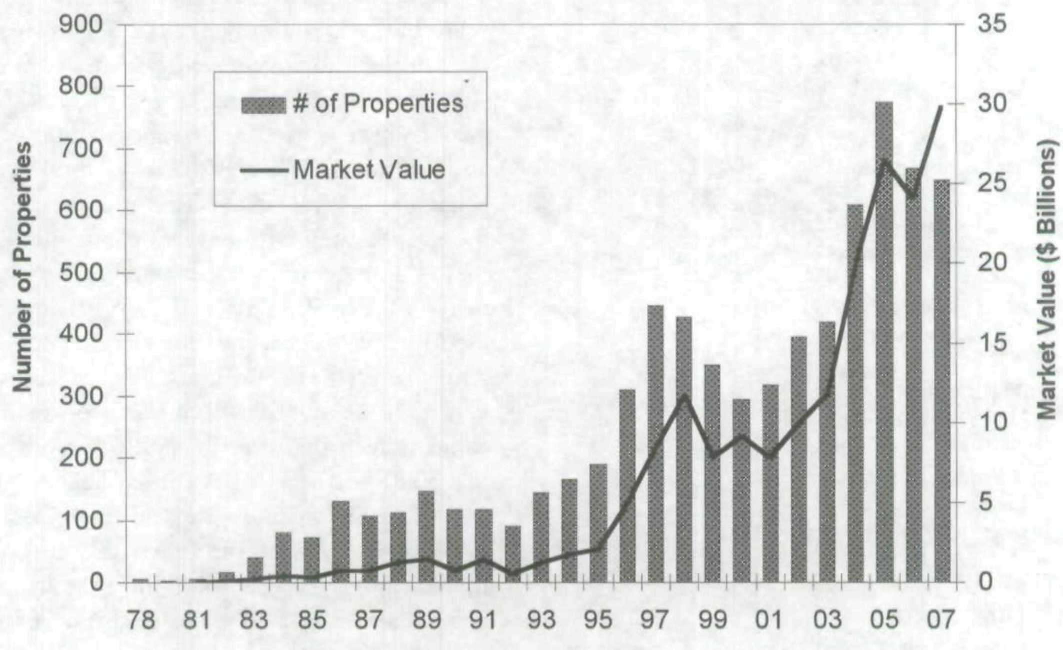
U.S. Institutional Investment Event Time Line and Price Level Index (nominal $)



Source: Modified version of Exhibit 7-11 in *Commercial Real Estate Analysis & Investments* (2nd *edition*), by D. Geltner, N. Miller, J. Clayton and P. Eichholtz, Thomson South-Western Publishing, 2007.

EXHIBIT 2

Institutional Investor Commercial Real Estate Transaction Activity (Sales of Properties in the NCREIF Index)



Source: National Council of Real Estate Investment Fiduciaries (NCREIF) commercial mortgage-backed securities (CMBS) markets and has facilitated major capital flows into real estate in recent years that have strengthened linkages between private real estate asset markets and wider national and global capital markets. The expanded investment opportunities provided by the two public quadrants, along with the new capital sources they have drawn to the real estate sector, have brought new arbitrage forces to bear on the real estate investment marketplace that have worked to improve market efficiency and pricing and stimulate the development of increasingly sophisticated real estate financial structures, analytical tools, capital sources and investment products.[3]

Despite the recognition as a more mainstream asset class, real estate now faces a new set of challenges. Today it must compete in the alternative space with private equity, hedge funds, infrastructure and more; all asset classes that offer challenges in terms of performance measurement and hence mixed asset portfolio analysis. Nevertheless, all of these components of the "alternatives basket" have gained quick acceptance over the past few years as the global "wall of capital" has searched the world over for higher risk-adjusted returns.

Consistent with these themes, the collection of articles in the third Real Estate Special Issue of *The Journal of Portfolio Management* demonstrates how the asset class continues to grow and adopt many of the features of the broader capital markets. International strategies, private equity strategies [with general partner (GP) - limited partner (LP) promoted fee structures], public REIT corporate governance, structured debt products (CMBS and CRE collateralized debt obligations), hedge funds, as well as commercial real estate index-based derivatives that allow synthetic exposure to real estate and offer advanced risk management (hedging) tools are among the topics covered in this issue. Yet, as several of the authors in this edition point out, real estate retains its distinct features as an asset class; the case for real estate remains strong, especially over the long-term. Over long and short time periods, its return patterns are rarely in close synchronization with stocks and bonds, despite the adoption of the financial tools and techniques of the broader capital markets. This paradox—further integration with the broader capital markets, yet distinct and separate financial behavior—is the underlying theme of nearly all the articles we received this year.

The editors were pleased to receive submissions from financial scholars who do not consider real estate their main focus. This is yet another sign that real estate has "come of age"... as it now attracts the best minds in the world of financial economics. We also received the most submissions ever from countries outside the U.S.; another sign that real estate is now increasingly understood as a global asset class. We did not have space for many fine articles; another sign that the quantity and the quality of real estate analysis is now on a par with the other asset classes regularly featured in *The Journal of Portfolio Management.*

CAPITAL MARKET INTEGRATION, GLOBALIZATION, AND THE CASE FOR REAL ESTATE

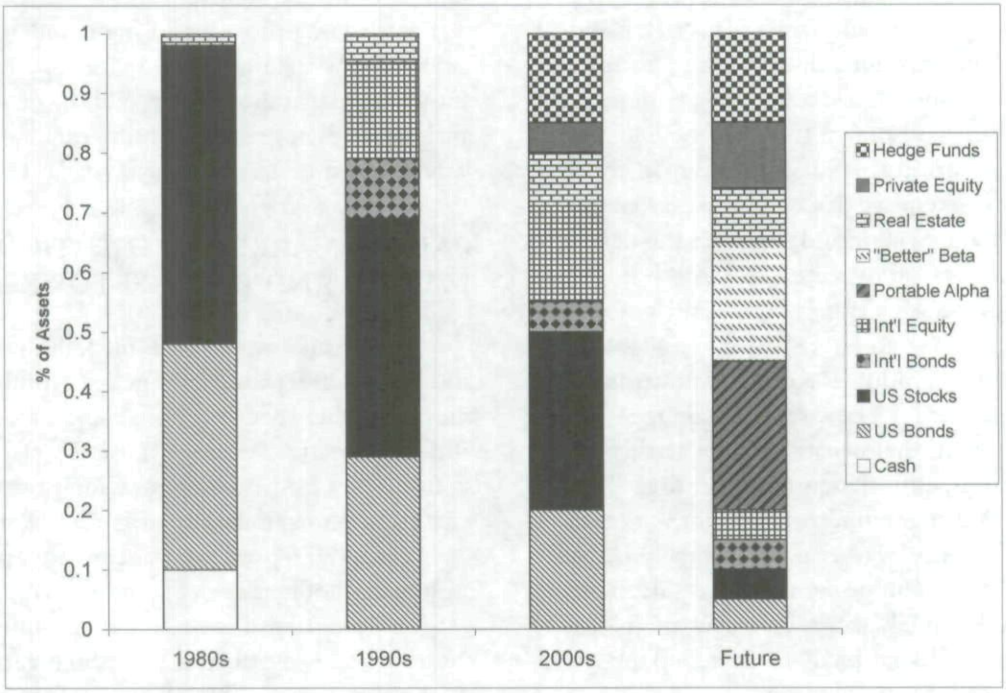
Three author teams (Ruff [2007], Idzorek, Barad, and Meier [2007] and Hastings and Nordby [2007]) investigate whether securitization, capital market integration and globalization erode real estate's claim to asset class status. They find no evidence for this; the role of real estate as a portfolio risk manager looks sustainable.

Ruff [2007] sets the stage for the special issue with an updated look at the risk and return characteristics of U.S. institutional real estate and an assessment of if and how these have been affected by securitization and capital market integration. He also examines the relationship between recent capital market dynamics and the cap rate compression witnessed in the real estate market over the past 5 or so years. Has there been a (rational) structural re-pricing of real estate risk or are short-term capital flows fueling the sharp drop in cap rates propelled by an overabundance of capital competing for limited product leading investors to overpay for property? Ruff [2007] concludes that both forces have been at work and that while some drivers of this phenomenon will prove to be cyclical, the evidence suggests that, long term, the commercial real estate risk premium will remain below its historical average and the case for real estate in mixed asset portfolios remains strong.

The search for higher return real estate investment opportunities, as well as additional diversification benefits, has led a number of investors overseas. With the integration of global capital markets it is only natural that real estate should follow and become a more global marketplace, a process that is well underway. Hastings and Nordby [2007] examine the case for global private real estate in strategic asset allocations of U.S. investors. They find significant diversification benefits associated with adding European and Asian property to U.S. dominated real estate portfolios. The passage of time, the accumulation of data and the introduction of information and analysis from international sources all reinforce, rather than erode, the

EXHIBIT 3

The Changing Nature of Institutional Investor Portfolios



Source: Based on an exhibit in New England Pension Consultant's Asset Allocation Letter, "Dare to be Great", February 2007.

"separate and distinct" asset class thesis.

Idzorek, Barad, and Meier [2007] explore the role of global commercial real estate in U.S. investor mixed asset portfolios using REIT and listed real estate stock indices to proxy the broader direct and indirect equity global commercial real estate asset classes. Increasingly investors are looking to the developing global REIT marketplace to execute their expanding international investment strategies. The authors employ traditional mean-variance portfolio optimization analysis with historical data as well as potentially more relevant and rigorous forward-looking optimization technology based on an innovative CAPM approach in which the authors incorporate real estate into the overall global market portfolio. With the former approach, using historical risk and return inputs, adding public U.S. real estate (REITs) dramatically improves portfolio risk and return characteristics, while adding public Asian and European real estate does not. However, in a series of forward-looking optimization exercises the authors find that global commercial real estate should play a relatively large role in strategic asset allocation going forward.

CHANGING PORTFOLIO STRUCTURES AND INVESTMENT STRATEGIES

The institutional investment environment is undergoing significant change as U.S. investors experiment with new investment products and strategies that challenge long accepted asset class definitions and blur the line between traditional asset classes and alternative strategies (see Exhibit 3).[4] What is driving such dynamic and dramatic shifts in the U.S. environment? According to the consultants, the major factors include actuarial requirements for funding public and corporate pension plans, as well as the potential implementation of more rigorous accounting standards that include a move to a mark-to-market environment. As a result, plan sponsors face growing pressure to locate the best sources of alpha regardless of investment category, to reduce portfolio volatility and to manage assets more closely to meet liability needs. As noted in the Greenwich report, "This is the world of absolute return, portable alpha, and liability-driven investment."

Where does real estate fit in? Some pension funds are now grouping real estate alongside other "real value" asset classes, like commodities and infrastructure.[5] This may be due to the fact that real estate's inflation protection can be shown to hold up through several different cycles. By contrast, these other "hard asset" categories have not yet fully established their inflation-resistant track record. Huang and Hudson-Wilson [2007] revisit the inflation-hedging characteristic of real estate with an updated analysis of the extent to which private commercial real estate returns protect against expected and unexpected inflation during the 1978-2006 period. In terms of inflation hedging capability, office is shown to be the strongest, followed by apartment and warehouse. Contrary to past studies and conventional wisdom, the retail sector is shown to have no significant hedging power against inflation. Also hedging efficacy derives mostly from capital appreciation rather than income return, suggesting that the inflation protection property derives from a real estate capital market phenomenon rather than a positive income inflation linkage related to lease and cost structures.

What does the structural shift in strategic portfolio allocations and the move into more alternatives mean for the role of real estate in institutional portfolios? Bond, Hwang, Mitchell and Satchell [2007] investigate this in a UK context and confirm that commercial real estate still earns its place in a mean-variance portfolio analysis alongside other new entrants such as commodities, infrastructure and non-real estate private equity.[6] Bond, Hwang, Mitchell and Satchell [2007] are careful to control for the "smoothing" or "understated volatility" problem that is endemic to appraisal-based private equity real estate indices (such as the IPD index or the NCREIF index). While this problem is now well understood, at least at the conceptual level, and has been addressed in the context of indices in several different countries, there remain concerns about the practical application of alternative approaches available to unsmooth such indices. Marcato and Key [2007] aim to put these fears to rest by investigating the impact of different unsmoothing techniques on the optimal role of real estate in mixed asset portfolios. They find that a number of commonly employed techniques yield very similar asset allocation choices. Resultant portfolio weights are more sensitive to the unsmoothing parameter than to the unsmoothing method.

While there is a large academic literature on "unsmoothing" that proposes various means of undoing the lags and correcting the bias in time series dynamics of appraisal-based indices, more recently, and most promising in the U.S., are new methodologies that use sales of properties to develop transaction-based indices for private commercial real estate. For example, the TBI, or transaction-based index, is a quarterly "hedonic" index derived from the sale prices of properties in the NCREIF database and the REAL index is a repeat sales price index derived from a much broader transactions set tracked by Real Capital Analytics.[7]

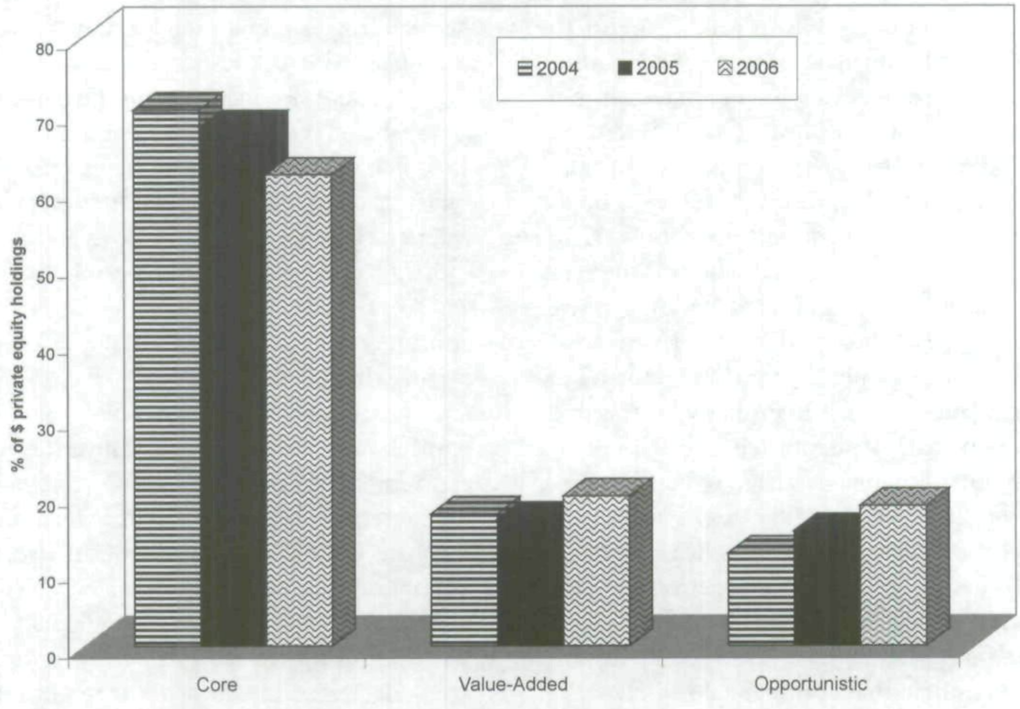
A major driving force for the development of transaction-based indices is the emerging U.S. property derivative market, a natural next step in the evolution of real capital markets, transitioning from a private asset class characterized by high transaction costs and the inability to sell short, to one with significant public market integration, and the associated fast pace of financial innovation, with continued improvement in price discovery and market pricing. In the second special issue, Fisher [2005] introduced property derivatives, in the form of NCREIF index return swaps. Derivatives allow investors to gain or reduce exposure to the real estate asset class by buying or selling the performance of a real estate return index, rather than real assets. The speed and ease of execution, reduced upfront capital requirement and ability to protect real estate portfolios on the downside, provide added flexibility in executing real estate investment and portfolio risk management strategies. An investor might sell (i.e. short) an index return swap to reduce the systematic real estate market component of its overall portfolios, a move motivated by the goal of focusing on alpha, or the desire to buy portfolio-level insurance against a real estate downturn.

To date, both the U.K. and the U.S. property derivative markets have developed as index return swap markets with contracts written on the Investment Property Databank (IPD) and NCREIF appraisal-based, benchmark return indices in each country. Though it is logical that the NCREIF Property Index (NPI) was the first index to be licensed for trading in the United States, it appears likely that the REAL transaction-based indices are set to come to the market. In this issue Geltner and Fisher [2007] push the property derivative research agenda forward in a rigorous theoretical analysis of the pricing of real estate index return swaps, highlighting the implications of both the inability to invest directly in, and differences in the times series properties of returns from underlying appraisal and transaction based indices for the equilibrium pricing of index swaps.

The expansion of investment alternatives being considered by institutional investors coincides with the trend to move up Sharpe's risk-return "capital market line", a phenomenon occurring across all asset classes, including real estate. Real estate investment managers are in a continual search for "high alpha" strategies, in much the same

EXHIBIT 4

Institutional Private Real Estate Equity Holdings by Investment Strategy



Source: Pension Real Estate Association annual Plan Sponsor Surveys

way that money managers in other asset classes are. This means that the intersection between leveraged buyout (LBO) strategies and real estate is inevitable. Over the past five or so years, migration up the real estate risk spectrum in search of higher returns beyond those offered by traditional "core" (stabilized properties with no or relatively low leverage) strategies has taken place along two dimensions: 1) more entrepreneurial and equity-like strategies ("value-added" and "opportunistic"), which rely less on contractual income and more on variable earnings through wealth-creating strategies, and 2) increased use of debt financing (financial leverage) to "juice" expected equity returns.

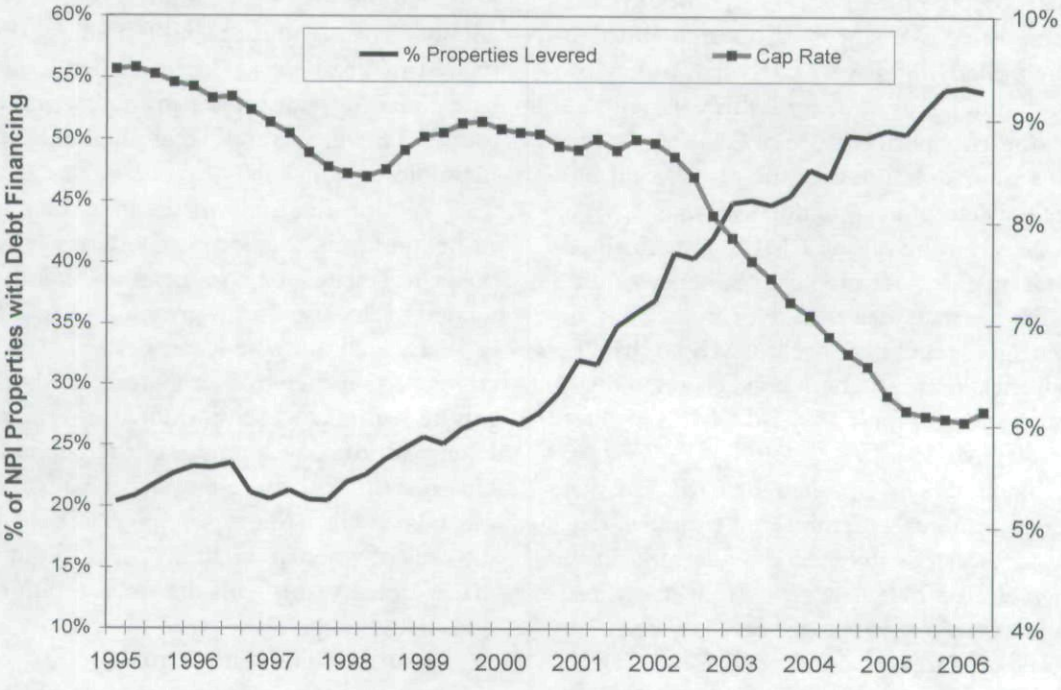
Exhibit 4 details the move by institutional real estate investors away from core property holdings towards riskier property investment strategies over the past three years, based on PREA investor member responses in the annual PREA Plan Sponsor Surveys. Exhibit 5 shows the growth in the popularity of debt financing of properties in the NCREIF index.[8]

In the first special issue Anson, Mark and Susan-Hudson Wilson [2003] looked at pros and cons for the use of debt by institutional investors, while Gordon and Wai Kuen Tse [2003] introduced a VaR modeling approach to quantify portfolio leverage risk. In this issue Pagliari [2007] revisits the impact of financial leverage on equity returns and risks within a comprehensive analysis of the pricing of non-core real estate investments. He aims to fill a knowledge gap and provide investors the requisite tools to understand and price non-core real estate ventures. In addition to leverage considerations, Pagliari brings new insights into the way value-add and opportunistic strategies change the tails of the return distribution relative to the "core strategies" that most asset allocation analysis relies on to model real estate performance in a mixed-asset context. The effects of leverage and promoted fee structures are found to alter the risk-return profile of real estate in both obvious and subtle ways.

The shift in investments away from core further up the risk-return spectrum is often discussed within the context of pension fund investors' need for higher return necessitating such a move, implicitly implying that investors may be taking on too much risk. Alternatively, if core property is over-priced in some sectors then value added and opportunistic investments may be less risky than core, not in an absolute sense, but in terms of a more favorable risk-return tradeoff. Investors' ability to identify mispricing that may exist within the real estate asset class requires a solid understanding of how risk premiums

EXHIBIT 5

Percentage of Properties in the NCREIF Property Index with Debt Financing (Financial Leverage) and Capitalization Rates on Properties Sold from the Index



Source: National Council of Real Estate Investment Fiduciaries (NCREIF)

and pricing vary across different types and locations of property investments.

How does the expected total return, or opportunity cost of capital (the DCF discount rate), differ across different types and locations of properties?[9] Pai and Geltner [2007] study this question using original, customized core property investment performance indexes constructed from the property-level NCREIF Index database. They specify a multi-factor model structure motivated by the popular Fama-French three factor model (that describes stock returns based on their sensitivities to a market return factor ("beta"), a size factor and a book-to-market factor) but with the book-to-market factor replaced by a "city tier" classification based on the amount of institutional property investment modified for institutional private real estate. The model results do not fit with the author's a priori expectations based on Fama and French's findings in the stock market leading them to conclude that there is a "Mars-versus-Venus" type of discrepancy between equities-versus-real-estate investors' risk perceptions and preferences, or else a real estate market that has performed ex post over the long run contrary to investors' ex ante expectations. Further analysis of the cross section of private real estate returns is a fruitful area for future research.

PUBLIC MARKET DEVELOPMENTS

Real estate investors have a rich menu of choices, due in large part to the development and maturation of the public real estate capital markets. Today, real estate project financing is carved up into various risk classes (or tranches), including senior and subordinate mortgage debt, mezzanine debt and preferred equity, as well as multiple classes of residual equity. Lenders can manage risk and source capital by securitizing senior mortgages via the CMBS market, and increasingly can turn to the growing collateralized debt obligation (CDO) market to package and sell subordinated mortgages, mezzanine debt and lower-rated CMBS bonds. Financial engineering of real estate and real estate security cash flows is leading to the creation of more exotic investments, including real estate securities hedge funds. The proliferation of choices allows custom tailoring of investment products and portfolios to meet requirements of a more diverse range of capital sources, resulting in increased liquidity and efficiency for the asset class over the long term.

Four articles in this issue address public market topics of interest to institutional investors. Two focus on public debt (CMBS and CDOs). Despite the fact that CMBS have become an accepted and important part of the fixed income universe, there is a paucity of research aimed at uncovering the underlying drivers of returns to CMBS investment. Xu [2007] aims to help fill this void with an analysis of the historical performance of CMBS vis-à-vis similarly rated corporate bonds over the past decade and investigation of the determinants of fluctuations in CMBS returns over time. Over this period CMBS outperformed corporate bonds on a risk-adjusted basis. Changes in the mortgage rate are the main driver of return variability in both investment-grade and high-yield CMBS. Changes in credit spreads affect returns to both bond classes, though the effect is much stronger for high-yield CMBS than for investment-grade CMBS.

Public market forces have pushed the CMBS market to adapt by creating new structures and products that target specific investor clienteles or provide innovative solutions to perceived problems with current structures. Essentially nonexistent five years ago, collateralized debt obligations backed by commercial real estate (CRE CDOs) have quickly become an accepted part of commercial real estate finance. Specifically, they are an important financing source and balance sheet management tool for buyers of non-investment grade CMBS bonds, thereby helping the CMBS market to continue to grow. Lucas, Goodman, Fabozzi and Manning [2007] help investors understand these relatively new securities, their evolution, current market trends, and historical performance.

Two articles address current "hot" topics on the equity side of the public real estate market. Chung, Fung, Shilling, and Simmons-Mosley [2007] explore issues related to hedge fund ownership of public REITs, while Bianco, Ghosh and Sirmans [2007] investigate the impact of external corporate governance forces on the pricing of REIT shares. U.S. institutional allocations to hedge funds have more than doubled since 2006, largely a result of the increasing proportion of pension funds investing in hedge funds.[10] The growth in the hedge fund sector has directly impacted the public real estate sector. Non-real estate dedicated hedge funds invest in CMBS bonds, public REITs and shares of real estate operating companies (REOCs). The use of long-short strategies in dedicated real estate securities funds is becoming more common. Chung, Fung, Shilling, and Simmons-Mosley [2007] examine the characteristics of real estate security holdings of hedge funds and test whether hedge fund managers have superior forecasting ability compared to other classes of institutional REIT investors. They find that the participation of stand alone "hedge funds" in real estate is modest, but that hedge funds sponsored by investment advisors have significant REIT holdings. Empirical tests suggest that real estate security hedge fund managers do have some superior forecasting ability and in general are found to prefer shares of larger, higher beta REITs with high idiosyncratic risk.

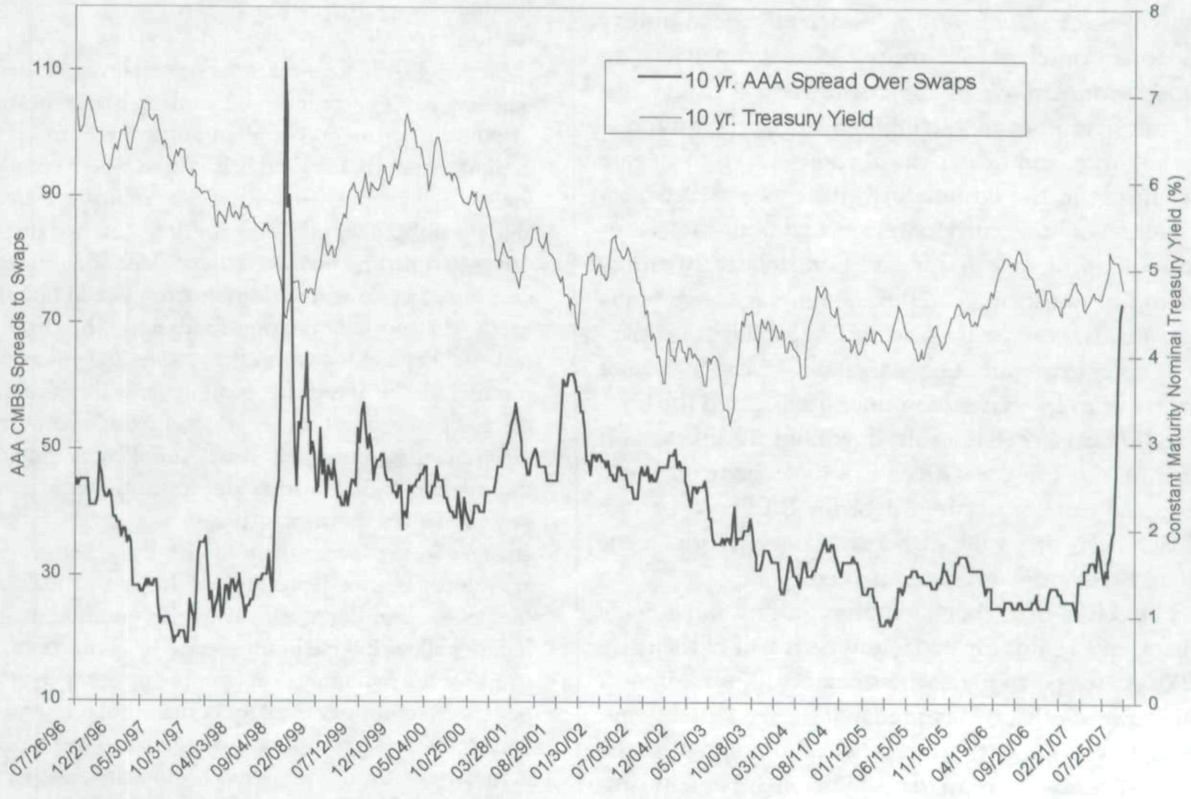
Pension funds are increasingly making allocations to hedge funds, and hedge funds are moving into the public real estate sector, yet pension funds themselves have tended to shy away from investing in REITs directly. In their article in this issue Idzorek, Barad, and Meier [2007] conclude that there is a strong case for both REITs and private real estate in institutional investment portfolios. Even with the development of the public REIT market U.S. institutional real estate has remained largely a private investment.[11] Many plan sponsors have struggled with the issue of where to include REITs within the portfolio management team, with the stock group or the private real estate group.[12]

Bianco, Ghosh and Sirmans [2007] propose that a potential explanation for the apparent underinvestment in REITs by U.S. pension funds derives from the separation of ownership and control in public companies. REITs must compete with private real estate investment vehicles for institutional funds. The growing concern over governance of publicly held corporations means that poor monitoring and the resultant loss of value could contribute to this phenomenon. Bianco, Ghosh and Sirmans [2007] study the impact of external governance or the market for corporate control and find no evidence to suggest that REIT managers are overly protected against takeover threats. In fact, barriers to hostile takeovers for REITs are less severe than for other less regulated firms. Over time there has been a move by individual REITs toward the industry norm so that the majority of REITs look similar with respect to takeover barriers, suggesting that investors need to pay careful attention to internal REIT governance.

The articles by Chung, Fung, Shilling, and Simmons-Mosley [2007] and Bianco, Ghosh and Sirmans [2007] lay a solid foundation for future research into the fundamental determinants of fluctuations in REIT prices, the cross-section of REIT prices and the pricing of public versus private market pricing. One potential fruitful path involves combining REIT ownership structure with liquidity and corporate governance. Liquid public markets are

EXHIBIT 6

Commercial Mortgage Backed Security (CMBS) Spreads and Treasury Yields



Source: Commercial Mortgage Alert and Federal Reserve Board

generally regarded as more transparent and efficient than private ones because information is widely dispersed and quickly capitalized into asset prices. Recent academic work that links corporate governance with liquidity and the investor clientele that holds a firm's stock reveals that this is not necessarily the case. Subrahmanyam [2007] finds that high liquidity is associated with weaker corporate governance. He conjectures that because highly liquid shares are relatively inexpensive to trade they attract short-horizon traders, who almost by definition do not have a long-term interest in a firm's corporate governance.[13] In thinking about the implications for the pubic REIT versus private real estate investment choice, these considerations suggest that the value placed on the higher liquidity of REITs could be less than the costs associated with added volatility from short-horizon traders and the loss of control and related corporate governance issues relative to private market investments (direct and in commingled funds).

REAL ESTATE IN PERSPECTIVE

What does all this mean for investors in real estate? The events of the "Summer of 2007" demonstrate that all this analysis does not prevent commercial real estate asset from being caught up in the gyrations of the credit markets and, specifically, the unwinding of the sub-prime residential mortgage market. The "separate and distinct" underlying features of commercial real estate do not grant immunity to powerful spasms passing through the credit and equity markets. Integration with the capital markets has come at a price. There is no better example of this than the near-shut down in the "B-piece" market for CMBS, despite the absence of incipient, major credit defaults. While financial analysts will have better perspective on the recent REIT and CMBS volatility with the passage of time, it does appear that worries about one sector (residential MBS) migrated to others (commercial real estate—debt and equity)...well ahead of any actual event risk.

Nevertheless, from a practitioner's perspective, it is clear that the first half of 2007 was most unusual. This was a period of time which included the closing of the largest real estate transaction in modern financial history (Blackstone's purchase of Equity Office Properties), an all-time record inflow of capital to private equity real estate funds, another in a string of all-time record transaction volumes, and finally, the abrupt reversal of an easy credit regime in the commercial real estate credit markets. Interest-only, negative coverage, and ultra-high loan-to-value lending all disappeared in relatively quick succession in the spring of 2007. Rating agencies tightened standards for securitizations and began kicking unacceptably risky loans out of large loan pools. Credit spreads widened out to levels not seen since 1998…and the conduit lending market all but shut down, until banks sell off a huge amount of excess inventory of securitized loans. At the same time, unsecured debt for REIT go-private and LBO deals dried up, as part of larger trends in the CDO and credit default swap markets.

The REIT market echoed this volatility and quickly gave back all its gains for 2007, as well as half of the gains of 2006. As we go to press, the story is still unfolding. It is clear, however, that by "coming of age", real estate must also somehow cope with its status as a full member in the global credit and equity markets. This membership subjects the asset class to new pressures and to new volatility drivers. It is the hope of the editors of this Special Edition that many of the articles here will help elucidate the connections between real estate and these larger underlying forces. The excess liquidity issues that we described in the 2005 editor's article continued to build right through until the summer of 2007. The abrupt reversal in this liquidity trend may be the capital market's acknowledgement that it had gone too far.

Institutional investors have come to understand that real estate is not superior to other asset classes, but it is different. This difference appears to hold up, even in light of rapid changes in the broader capital markets. The way that liquidity expands and contracts in commercial real estate may also have distinctive characteristics, as yet unstudied. The events of 2007 may encourage analysts to tackle this intriguing and complex question: Does the integration of real estate into the broader capital markets mean that changes in real estate liquidity have less to do with real estate's fundamental capital requirements… and more to do with what is going on in the rest of the global capital markets? We await the 2009 Special Real Estate Edition, where we hope that authors will address this as yet unanswered question.

ENDNOTES

[1]This characterization derives from the article, "The Rodney Dangerfield Effect" written by one of the authors (Gordon [2002]).

[2]ERISA required that the principles of Modern Portfolio Theory (MPT) be adopted, requiring plan sponsors to diversify their investments broadly so as to minimize portfolio risk per unit of return. Unlevered, stabilized income property, widely viewed as a relatively stable, long-term investment with favorable portfolio diversification and inflation hedging properties, was welcomed by many as an excellent addition to portfolios dominated by cash, and domestic stocks and bonds. Unfortunately, the move by pension funds and other institutions into real estate coincided with other events and an economic environment in the 1980s that precipitated a sharp run up in commercial property values, a period of significant overbuilding of new structures and an eventual painful crash and correction in the market. Inflation fears and institutional investor demand bolstered the commercial real estate market at a time when changes in tax laws enhanced already generous depreciation allowances and tax shelters for wealthy individuals. Also during the 1980s, the deregulation of the savings and loan (S&L) industry allowed these institutions to invest in commercial mortgages for the first time, thus opening up another new and inexperienced source of capital for commercial property, and adding fuel to the real estate boom. By the late 1980s tax reform had eliminated most of the special tax incentives, the overbuilding and extent of the financial crisis in the savings and loan industry were recognized, and the commercial property market suffered a major downturn.

[3]Clayton and Giliberto [2006] suggest that continued innovation in real estate capital markets is blurring the lines that define the "four quadrants" (public and private equity, public and private debt) of real estate investment. The quadrant framework was adopted by many institutional investors following the expansion of the public markets. With capital markets becoming more adept at slicing, dicing and pricing cash flows from individual real estate assets and portfolios, a "capital stack" paradigm that encapsulates an expanding range of liquidity and risk-return choices is taking center stage for investment decisions and portfolio construction. Conner and Liang [2003] and LaPossa and Seaman [2007] provide additional insights into the transformation of the institutional real estate investment landscape.

[4]"New Products and Strategies Shake Up "Traditional" Asset Allocations for U.S. Institutions," Greenwich Associates Report, February 2007.

[5]Many pension plans and endowments now group investments into three categories: equities, bonds and "real assets" which include infrastructure, real estate, commodities and inflation-index bonds (See Kopcke [2006]).

[6]These UK-based conclusions are consistent with the

findings in a recent US study (Peyton and Lotito [2006]).

[7]Both the TBI and the RCA-Based indices were developed by researchers at the MIT Center for Real Estate in conjunction with colleagues at other major universities. The data is available for download at the MIT Center website http://web.mit.edu/cre/research/credl/.

[8]The PREA Plan Sponsor Surveys also details the use of debt financing by institutional investors. More than 80% of the 75 PREA investor members responding to the 2006 survey report using debt financing and the overall average portfolio level loan to value ratio is about 40%. Nearly half of survey respondents have maximum allowable leverage limits in the 31 to 50% range.

[9]We seem to have a grasp on the risk premium associated with institutional real estate at the asset class (i.e. macro or "big picture") level. Measuring the real estate risk premium using a single-factor CAPM with beta defined relative to a national market (wealth) portfolio comprised of stocks, bonds, and real estate, with real estate returns corrected for appraisal-based smoothing, suggests an equilibrium expected total return risk premium in the neighborhood of 300 basis-points (see Geltner [2005]). Much less is known, however, about what factors determine the cross-section of property returns within the institutional real estate asset class (i.e. at the micro level) and how a given property's or market segment's expected return should differ from that average, within the institutional core real estate asset class (Pai and Geltner [2007]).

[10]See "New Products and Strategies Shake Up "Traditional" Asset Allocations for U.S. Institutions," Greenwich Associates Report, February 2007.

[11]According to the *Pensions & Investments* survey of the top 1,000 defined benefit plans, the top 200 plans had REIT holdings of about $29 billion at the end of 2006. The market capitalization of the firms in the NAREIT equity REIT index was $401 billion at the end of 2006 which implies that defined benefit pension funds owned only about 7 percent of REITs by market cap. The 2006 PREA Plan Sponsor Survey found that public REITs comprise only about 12% of total (public and private) real estate investment and are held by slightly less than one half of the plans surveyed.

[12]This may be changing somewhat as many plans are beginning to use the developing global REIT marketplace to execute their expanding international investment strategies.

[13]If short-horizon traders are uninformed, sentiment-based investors they may also push share prices away from fundamental value and create excess volatility in share prices.

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