IVORY TOWERS TO OFFICE TOWERS, WALL STREET TO MAIN STREET:  
A STUDY OF THE RELATIONSHIP BETWEEN MODERN PORTFOLIO THEORY  
AND  
PRIVATE EQUITY REAL ESTATE  
By  
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B.A., Politics and Modern History  
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Submitted to the Department of Architecture  
in Partial Fulfillment of the Requirements for the Degree of  
Master of Science in Real Estate Development  
at the  
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August 2001  
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David B Marks

Submitted to the Department of Architecture
on August 14, 2001 in partial fulfillment of the requirements
for the degree of Master of Science in Real Estate Development

ABSTRACT

This thesis attempts to relate the principal elements of Modern Portfolio Theory ('MPT') to real estate, recognizing that MPT was built not for real estate, but for stocks and bonds. It is split into two parts; the first part deals with 'the theory' of real estate investing, including a commentary on both why mixed-asset portfolios include real estate components, and how MPT relates to real estate.

The second part deals with 'the reality'; the extent (or otherwise) to which different investor types apply MPT to their direct, private equity real estate investment strategies. It attempts to answer this question by a case study approach, focusing on four investor types. These investors were specifically chosen because of the fact that they are, in each case, sophisticated groups who have a knowledge and understanding of the principal elements of MPT. The extent to which they feel that all elements of MPT are relevant to real estate is, ultimately, the question that this paper attempts to answer.

Thesis Supervisor: Professor Timothy Riddiough
Title: Professor of Real Estate Finance, Department of Urban Studies and Planning, MIT
ACKNOWLEDGEMENTS

I am indebted for the help, advice and inspiration I received in writing this thesis. Professor Tim Riddiough was encouraging of my idea to take the classic elements that make up Modern Portfolio Theory, and ‘test’ their frequency of use in the real world.

I would like to thank several people who have both taught me and inspired me in the property game. Firstly in London, to my father and Harvey Selby, who got me curious about the business. They are both great guys. To Tony Horrell and Tony Edgley at Jones Lang LaSalle. They taught me tons of stuff and were both great fun to work with. To Sir Stuart Lipton and David King. They are both great developers. And finally in Boston, to Tim Riddiough and Tod McGrath. They taught me tons more stuff and are both great teachers.

In writing this thesis (and a related term paper) I would like to thank all those people who gave me both time and ideas. Particularly Dan Prigmore at The Baupost Group, Roger Orf at Pelham Partners, Joey Kaempfer at McArthur Glen, Michael Spies at Tishman Speyer, Howard Ronson at HRO, Rick Lewis at Curzon, Rick Sokolov at Simon Property Group, Jeffrey Small at MD Hodges, Chad Pike and John Gray at The Blackstone Group, and Mary Ellen Grant at State Teachers Retirement System of Ohio.

Thank you to my parents for being so supportive. Finally, thanks to Amber for being so wicked.
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1952 was a critical year for the US real estate industry. If one had asked the leading three players in the business at the time to tell you why 1952 was such a milestone, several responses may have been forthcoming. One answer may have referred to Eisenhower's victory in the Presidential election, placing a Republican in the White House for the first time since Herbert Hoover twenty-four years earlier. Another answer may have referred to the commencement of the Mile High Center in Denver by William Zeckendorf, one of the most successful development projects in the nation, built by the most prolific real estate investor in post-war America¹. Perhaps the third answer would have referred to the completion of Lever House in Manhattan, the 24-storey, SOM-designed glass and steel office tower that literally changed the face of modern commercial architecture². In hindsight however, all three answers would have been wrong. 1952 was a critical year for real estate because an obscure grad student at the University of Chicago named Harry Markowitz published a paper that, for the first time ever, began to mathematically link asset returns with the notion of risk³. Nearly fifty years have passed since Markowitz began the study of what is now known as Modern Portfolio Theory ("MPT"). For many years, the work of Markowitz and the other economists who contributed to MPT was basically ignored by Wall Street; it
appeared as if ‘ivory tower theories’ had no place in the world of ‘white shoe realities’.

However, by the late 60’s and early 70’s, it was apparent that a different approach was needed by Wall Street in order to continue the efficient allocation of investment capital in the United States, given that both inflation and stock market uncertainty were becoming regular factors in the capital markets.

During the course of the 70’s and early 80’s, previous academic papers that had been published, read and promptly forgotten about, were revisited, reapplied and eventually revered as the classic theories of modern investing. Markowitz was joined by a host of other PhD’s and college professors who became, in the words of one commentator, “the new high priests of finance”; Sharpe, Ross, Samuelson, Fama, Modigliani, Miller, Black, Scholes and others became compulsory reading at leading US business schools, and hence the names to drop at the innovative end of the floor in Wall Street’s financial laboratories. Wall Street has always encouraged new and more complex approaches to the age old question (“how do I get richer, quicker?”), and the economists listed above became common parlance amongst the world’s financial elite.

At any one place in time, there is a particular location (usually on Manhattan) that seems to embody everything that is new and cutting-edge in the capital markets, and a corresponding set of individuals that appear to define an era. In most instances, the
culture and history that seems to consistently pervade all these working environments is a heady combination of; i) hard work ('got to make as much money as possible before the rest of the world catches on'), ii) a new take on MPT ('the math is so complex, you probably wouldn't understand it'), iii) dominant individuals and egos driving the process ('he's a genius, so let him be rude'), iv) parent firms or patrons who don’t truly understand the new markets (and risks) being created ('all I know is that that team delivered 30% of the profits this year') and unfortunately, eventually, v) a spectacular crash and loss of capital when either the MPT variant is revealed to be flawed, or (sometimes in combination), the SEC comes in for a chat.

So, where have these places, ideas, people and firms been over the last 30 years? Arguably, in the mid-to-late 70’s, it was in Robert Rubin’s Arbitrage Dept. at Goldman Sachs. In the early 80’s, it was undoubtedly on Salomon’s bond trading floor. In the mid 80’s, the innovations (and illegalities) were taking place in the Drexel Burnham junk bond universe of Milken and Boesky. Also during this time, LBO’s (with the emphasis on the ‘L’) became the preferred route of corporate take-over, via the work of firms such as KKR and Fortsmann Little. By the early 90’s, the quant-jock approach to options and derivatives arbitrage was the realm of DE Shaw. By the mid 90’s, right up until Russia’s debt default in August 1998, it was at John Meriwether’s, MIT-trained hedge fund team at Long Term Capital. Until very recently, many commentators thought that the private equity firms who threw billions of dollars at badly dressed computer geeks from Silicon
Valley were ‘the Next Big Thing’, with their view of fundamental valuation analysis temporarily blurred by the mirage of ‘the New Paradigm’ (basically, a half-baked excuse to ramp NASDAQ P/E ratios into the stratosphere).

The question is, what does all this have to do with real estate? The answer, in many respects, is two-fold. On the one hand, MPT and the new financial architecture had a hugely beneficial effect on real estate. In the mid-to-late 70’s, when institutional investors began to see the benefits of portfolio diversification (and accepted the low correlation of real estate), massive funds began to flow into the sector. The low beta’s (i.e. volatility) of the asset class were also viewed as a significant plus point in favor of real estate, even taking into account the fact that this volatility was almost certainly under-stated by the lack of real time pricing (and hence a reliance on the ‘smoothed’ process of appraisals). In addition, the innovations of Wall Street essentially rescued the sector from institutional oblivion after the early 90’s crash, persuading investors to ‘stay in the game’ by holding real estate in new, liquid formats such as CMBS paper and newly remodelled REITs. Lastly, the classic MPT theories on capital structure helped the real estate sector gain a better understanding of the true risks and rewards of leverage, which was undoubtedly a positive outcome, given the fact that the income-producing, tangible collateral of real estate attracts (high) levels of debt which are not seen in other areas of the economy.
On the other hand, many of the innovations in MPT that have been relevant (and beneficial) to other asset classes have had a detrimental effect when applied to real estate. Certainly, applying the notion of Efficient Market Theory to an asset class in which all of the assets, by definition, are different, poses great problems. Trading costs are higher and the flow of reliable information more scarce than in other asset classes. In addition, the notion of asset allocations and portfolio weightings always appears to create an unpredictable flow of funds to the sector, for instance when institutions seek to off-load real estate in order to reduce weightings, not because the assets have performed badly, but because other assets have performed badly, thereby pushing up the relative weighting of the real estate portfolio. Sam Zell bemoaned the effect of the "MBA's influence" on real estate when he predicted (shortly before the late 80's/early 90's crash) that "the Hewlett Packard jockeys of the scientific real estate community will be replaced by the traditional real estate professional who has learnt his trade in operation, and not in projection of real estate." 7

The huge loss of capital and negative investment returns that took place in the early 90's crash (NCREIF Total Returns of -5.6% in 1991 and -4.3% in 1992)8 threatened to remove real estate altogether from the portfolios of many key institutions. As Riddiough stated, "you really have to be a strong believer in diversification to passively accept investment performance of the early 90's"9. It was time for the asset class to grow up, become more disciplined and be taken under the watchful guidance of the capital
markets. Both The Fed and Wall Street could ill afford another repeat of the RTC debacle, which was estimated by one observer to have cost US taxpayers around $200 bn.10

This paper attempts to analyze which elements of MPT are applicable (and just as importantly, utilized) in direct, private equity real estate investment. It is split into two parts; the first part deals with ‘the theory’ of real estate investing, including a commentary on both why mixed-asset portfolios include real estate components, and how MPT relates to real estate.

The second part deals with ‘the reality’; the extent (or otherwise) to which different investor types apply MPT to their real estate investment strategies. It attempts to answer this question by a case study approach, focusing on four investor types. These investors were specifically chosen because of the fact that they are, in each case, sophisticated groups who have a knowledge and understanding of the principal elements of MPT. The extent to which they feel that all elements of MPT are relevant to real estate is, ultimately, the question that this paper attempts to answer.
SECTION A: THE THEORY

1.0 Why Invest in Real Estate?

The traditional position of real estate within a mixed-asset portfolio was to regard it as a safer return than stocks, but with a higher return than bonds, i.e.: ‘in the middle’ of its’ two larger (and hence more dominant) partners in the risk-return spectrum. Real estate was seen as an excellent diversifier, with a low relative correlation to both stocks and bonds, as well as being perceived as an effective hedge against inflation. That was, broadly, the overly simplistic view of the main attributes of real estate within the context of institutional portfolios throughout most of the 1970’s and 80’s. Despite the fact that real estate’s position in portfolio allocation models has become infinitely more complex over the last 10-15 years, the traditional reasons for including it in a mixed-asset portfolio (as described above) are still valid. However, given the fact that Gerald Ford is no longer President, Elvis is dead and 10 year Treasuries no longer yield close on 11.5% (as they did in 1980)\(^1\), it is time to jump forward to the present day, in order to analyze how the ‘new, improved, more disciplined’ real estate sector sits within both institutional and private investor portfolios.
The principal arguments for investing in real estate could be broken down into two broad headings, namely “Philosophical Reasons” (i.e.: a listing of the asset class attributes that are more or less constant, such as the diversification benefits or the inflation-hedge aspects) and “Contextual Reasons” (i.e.: an ever-changing comparison of real estate’s relative value to stocks and bonds). Currently, these could be listed as follows:

**Philosophical Reasons**
- A Wide Range of Risk/Reward Strategies and Products
- A Hedge against Inflation
- Tax Structuring and Deferral Benefits
- Portfolio Diversification
- Relative Resistance to Economic Recession
- Substantial Size of Investable Universe

**Contextual Reasons**
- Attractive Current Relative Valuation
- Increased Capital Markets Discipline
- Reduced Volatility
- Strong Current Income

The above investment characteristics of real estate can be commented on as follows:
PHILOSOPHICAL REASONS

1.1.1. - A WIDE RANGE OF RISK/REWARD INVESTMENT STRATEGIES AND PRODUCTS

Despite the fact that REITs were created way back during JFK’s administration\(^2\), it was not until the recent recovery period of the sector in the early-to-mid 1990’s that REITs and CMBS added enough sophistication and critical mass to truly expand the liquid (i.e.: real-time tradable) investment possibilities in the sector. The increased range of investment products and returns that real estate began to offer was an absolute imperative considering the parallel innovations that were taking place in other asset classes. Institutional investors now choose from a wide range of financial products that compete for the ‘mid-way’ risk-return spot in their portfolios that was traditionally real estate’s domain. For example, equity-like convertible debt encroaches from one side and debt-like preferred equity creeps in from the other. Indeed, for a while (especially during and in the immediate aftermath of the real estate crash of the late 80’s and early 90’s), real estate’s illiquid, lumpy and management-intensive characteristics were in danger of consigning the asset class to history within institutional portfolios.

However, real estate’s leading participants (with help from Wall Street) refused to let the asset class be “squeezed-out” of the institutional portfolio by new-fangled variants of stocks and bonds, and thus spawned many new real estate derivatives which could also jump both ways along the risk-return spectrum. AAA-rated CMBS now occupies one
Given the broad range of options currently available, today’s real estate investment manager is faced with a substantially more complex decision-making process than his predecessor from the 70’s and 80’s, who could afford to restrict himself to 3 generic questions throughout his career, namely “lend, or purchase outright for cash?”, “Chicago, LA or Dallas?”, and “office, retail or industrial?".

The competitive nature of capital allocations in both institutional and private investor portfolios was commented on by LaSalle Investment Management when they stated that “dedicated real estate capital now competes every day with footloose capital,
which has no ties, emotional or otherwise, to the asset class. Thus, investments backed up by similar properties can perform very differently, depending on how they are plugged into the capital markets. In other words, the slicing and dicing that is now prevalent in US direct real estate markets can provide investors with different risk tolerances, with commensurate return profiles, via separate financial claims within the same underlying asset.
For example, a hypothetical $100m Manhattan office tower might provide the following matrix of both liquid and illiquid returns:

<table>
<thead>
<tr>
<th>INTEREST PROFILE</th>
<th>TYPICAL INVESTOR PROFILE</th>
<th>APPROX. SIZE OF INTEREST</th>
<th>TYPICAL TOTAL RETURN PROFILE</th>
<th>RELATIVE RISK</th>
<th>RELATIVE LIQUIDITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fee simple interest</td>
<td>College Endowment Fund</td>
<td>$5m</td>
<td>6.50%</td>
<td>Low (safest position)</td>
<td>Medium liquidity. An interest to be traded in the private, direct market to long term investors. Safest position in the capital structure.</td>
</tr>
<tr>
<td>Senior loan (AAA tranche)</td>
<td>Life Insurance Co.'s</td>
<td>$60m in total</td>
<td>7.0%</td>
<td>Low (safe position)</td>
<td>Highly liquid asset, as $60m AAA-tranche is sold in $5m pieces. Liquidity provided via investment-grade CMBS market.</td>
</tr>
<tr>
<td>Senior loan (BBB tranche)</td>
<td>Mortgage REITs</td>
<td>$10m in total</td>
<td>8.0%</td>
<td>Low to medium</td>
<td>Medium liquidity. $10m BBB-tranche is sold in $1m pieces. Relatively strong liquidity via CMBS market in normal market conditions, but suffers when credit spreads widen.</td>
</tr>
<tr>
<td>Mezzanine loan</td>
<td>Dutch pension fund</td>
<td>$7m</td>
<td>11.0%</td>
<td>Medium</td>
<td>Low relative liquidity. Could potentially be sold into a junk status CMBS tranche, but more likely to be traded via private syndication market to other funds or banks.</td>
</tr>
<tr>
<td>40% equity pos.</td>
<td>Office REIT</td>
<td>$7.2m</td>
<td>14.0%</td>
<td>High</td>
<td>Interest in asset itself is relatively illiquid, but investors can obtain indirect exposure to the JV equity position via the liquid market for the REITs' stock.</td>
</tr>
<tr>
<td>40% equity pos.</td>
<td>Private German</td>
<td>$7.2m</td>
<td>14.0%</td>
<td>High</td>
<td>As above (i.e. identical pari passu equity position), but with no possibility of indirect exposure, as held by private investor.</td>
</tr>
<tr>
<td>20% equity pos.</td>
<td>Local NYC developer</td>
<td>$3.6m</td>
<td>20.0%</td>
<td>High (riskiest position)</td>
<td>Equity position subordinated to other 2 JV partners by means of a priority return. Essentially an illiquid &quot;fee plus super-profit&quot; position. Riskiest part of capital structure.</td>
</tr>
</tbody>
</table>
1.1.2 - A HEDGE AGAINST INFLATION

There are multiple elements of a traditional direct real estate asset that provide the investor with inflation-hedging attributes. In particular, the critical NOI component is typically ‘protected’ against inflation in operating expenses (and taxes) via Expense Stop clauses (which pass on increased costs to the tenant). In addition, a fair proportion of leases (especially those created by way of sale and leasebacks to corporate occupiers) allow for the rental income to be adjusted periodically in line with an inflation index.

Lastly, assets such as real estate (and cash and gold) tend to perform well in inflationary environments, as investors shift their portfolios to include asset types with a more tangible component.

In any event, by holding a diversified portfolio of direct assets with staggered lease expiry dates, the differing lease lengths in various asset sectors allow for the compounded inflation-adjusted rental rates to be captured on a rolling basis. Real estate’s relative strong performance in the inflationary era of the 1970’s and early 80’s (along with the passage of ERISA in 1974) resulted in institutions recognizing the inflation-hedging aspects of the asset class.
1.1.3 - TAX STRUCTURING AND DEFERRAL BENEFITS

Real estate offers taxable investors (i.e.: most of the investing public with the exception of pension funds and efficiently-structured foundations and trusts) the unique ability to structure their investments in a tax efficient manner, particularly through the tax benefits of leverage. Incorporating tax strategies into the overall approach to investing allows the owner to maximize current deductions and depreciation-related benefits, whilst minimizing capital gains at the time of sale. In addition, deferral of taxable gains can be accomplished by utilizing like-kind exchanges to roll proceeds from one investment into another without recognizing the gain.

1.1.4 - PORTFOLIO DIVERSIFICATION

A consequential benefit of real estate investment in a mixed-asset portfolio is diversification; the greatest tool that an investor can use to protect assets against extraordinary changes in any one market or asset class. The extremely low correlation of both direct and indirect real estate with stocks and bonds is illustrated by the following data, which demonstrates over a ten year period the value of real estate as a critical diversifier in any mixed-asset investment strategy.
Cross Correlation Matrix of Returns (4Q 1990-3Q 2000)

*Source: Lend Lease*

<table>
<thead>
<tr>
<th></th>
<th>NCREIF</th>
<th>Wilshire REIT Index</th>
<th>S&amp;P 500</th>
<th>Lehman Bond Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCREIF</td>
<td>1.00</td>
<td>-0.05</td>
<td>0.06</td>
<td>-0.20</td>
</tr>
<tr>
<td>Wilshire REIT Index</td>
<td>-0.05</td>
<td>1.00</td>
<td>0.27</td>
<td>0.16</td>
</tr>
<tr>
<td>S&amp;P 500</td>
<td>0.06</td>
<td>0.27</td>
<td>1.00</td>
<td>0.13</td>
</tr>
<tr>
<td>Lehman Bond Index</td>
<td>-0.20</td>
<td>0.16</td>
<td>0.13</td>
<td>1.00</td>
</tr>
</tbody>
</table>

The classic argument that attempts to refute the apparent low correlation of real estate with stocks and bonds is that direct real estate relies on periodic appraisals in order to assess returns, which are prone to smoothing effects. Even taking this factor into account (most institutions simply make an informal ‘allowance’ for the smoothing effect), real estate is still reckoned by most participants to have a low correlation with other asset types.

1.1.5 – RELATIVE RESISTANCE TO ECONOMIC RECESSION

In relative terms, real estate provides good defensive return qualities in a recession. Real estate investments generally have longer market cycles than other asset classes due, in part, to the prolonged time required to match capital and investments, as well as the smoothing effect of staggered lease expirations. A typical multi-tenanted office building with varying lease expirations and strong tenants will continue to generate stable and consistent income during an economic downturn.
A recent study by Lend Lease illustrated the resilience of real estate to weak periods of economic cycles by comparing the number of years in which real estate registered negative total returns, compared to the negative return history of stocks and bonds. Due in part to the high initial income of real estate (i.e. the cap rate element), between 1934-1999, real estate only registered negative returns 5% of the time, compared to 25% of the time for stocks and bonds. (See chart below).

**Positive and Negative Years for Real Estate, Stocks and Bonds: 1934-1999**

*Source: R.W. Kaiser; 'Why Pension Funds Should Invest in Real Estate Now', (Bailard, Biehl & Kaiser Inc.); Ibbotson Yearbook for Stocks and Bonds; Rosen Consulting Group; Lend Lease*
1.1.6 - SUBSTANTIAL SIZE OF INVESTABLE UNIVERSE

Estimating the total size of the stock and bond markets in the United States is a relatively easy process; the total market capitalizations of the main exchanges provide the former, whilst the total outstanding tradable debt of Federal, State, Municipal and Corporate borrowers constitutes the latter. In March 1998, Merrill Lynch estimated the total size of the US Investable Capital Market at $35.5 trillion (including commercial real estate), as follows:

<table>
<thead>
<tr>
<th>Total Market Size</th>
<th>Market Share (%)</th>
<th>Comments (additional comments/figures from Merrill Lynch, unless otherwise stated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonds and Cash</td>
<td>$20.0 trillion</td>
<td>57% F[igures from Bond Market Association and Federal Reserve System (1997) estimate total marketable public and private debt at $12.0 trillion, implying that the Merrill Lynch figure (of $20 tr) includes around $2.0 trillion of non-tradable public debt (i.e. public debt held by the Federal Govt.) and $6.0 trillion of cash and short-term CD’s. Merrill Lynch figures also include $2.0 trillion of mortgage-backed securities (i.e. Govt. Agencies and CMBS).</td>
</tr>
<tr>
<td>Stocks</td>
<td>$12.0 trillion</td>
<td>33% Comprises total market capitalization of NYSE, NASDAQ and AMEX</td>
</tr>
<tr>
<td>Real Estate</td>
<td>$3.5 trillion</td>
<td>10% Excludes single-family homes and all agricultural and other land (NB: see comments below for a lower estimate of total institutional real estate market, using figures from Lend Lease/PWC and The Roulac Group)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$35.5 trillion</td>
<td>100% Between 1988-1998, stock values quadrupled, bond values doubled, but real estate remained flat (taking into account late-80’s real estate boom, early-90’s collapse and mid-90’s recovery)</td>
</tr>
</tbody>
</table>

However (notwithstanding the Merrill Lynch estimate above), providing a definitive figure for the total size of the institutional-grade US real estate market is a more
subjective process. Two of the most widely utilized surveys in this regard are the annual ‘Emerging Trends in Real Estate’ published jointly by Lend Lease and PWC, as well as the quarterly ‘Capital Flows Database’ published by The Roulac Group. The Lend Lease/PWC report estimated the total size of the US commercial real estate market at $4.3 trillion, of which around $1.93 trillion (or 45%) was considered to be of “institutional grade”. This latter figure is broadly comparable to the latest figures from The Roulac Group, who estimate the total size of the investable real estate market at $2.35 trillion. (The principal difference between the Lend Lease/PWC figure of $1.93tr and The Roulac Group figure of $2.35tr is that The Roulac Group ‘add’ a further $400bn of equity capital represented by private equity, non-institutional owners). 4

One of the reasons that most investors with mixed-asset portfolios hold real estate mainly in a direct format is 'size'; only 24% of the $2.35 trillion US real estate market is held in a public format⁵, thereby limiting the options of the investor who wants to have a reasonable exposure (say, 5%-10% plus) to the sector. In a recent research note on global real estate, Barton Biggs, the influential Head of Global Strategy at Morgan Stanley, commented as follows: “Decisions about asset class allocations are crucial, particularly for institutional portfolios. In the long run, say 20-30 years, we all recognize that equities are the place to be, but the long run is made up of a series of short runs...there is one big asset class that could deliver 10%-14% per annum, and that is
global real estate...the benchmark weight we use for real estate for global multi-asset portfolios is 10%...the case can be made, however, that the benchmark should be higher...traded real estate securities should definitely be part of a real estate investment program, but they simply do not have sufficient market cap to accommodate 10% or more of the assets of a large institution. A major real estate program has to be mostly private”.  

To put the size of the $2.35 trillion investable US real estate market in context, the current market capitalization of the NASDAQ is similar, at around $2.30 trillion, albeit down from its high point in Spring 2000 when the NASDAQ was valued at $3.6 trillion.  

(This latter point, i.e.: the huge volatility in the stock market during 2000-2001, compared to relatively stable real estate values, is precisely why real estate is seen as a beneficial diversifier in mixed-asset portfolios. This factor is discussed below in Section 1.2.3 ‘Reduced Volatility’).
CONTEXTUAL REASONS

1.2.1 - ATTRACTIVE CURRENT VALUATION

In order to make a relative judgment regarding the risk-adjusted returns from an asset class, investors typically use a measure of return known as a Sharpe Ratio, which provides a measurement of the level of excess return for additional risk taken. (This measure of return is discussed again in Chapter 2.3). The relevant issue in respect of real estate's current attractiveness as an asset class is that the Sharpe Ratio for real estate has been substantially higher than that for stocks and bonds over the last three years. With an average Sharpe Ratio of 5.33 in the period from 4Q 1997-3Q 2000, private equity real estate returns have delivered risk-adjusted returns nearly 10 times higher than that of the S&P 500 and 25 times greater than that of bonds, as illustrated below.

3 Year Risk/Return History (Quarterly returns, annualized: 4Q1997-3Q2000)

(Source: Lehman Bros.; Bloomberg; NCREIF; Wilshire Associates; Rosen Consulting Group; Lend Lease)

<table>
<thead>
<tr>
<th></th>
<th>Average Returns</th>
<th>Standard Deviation</th>
<th>Sharpe Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;P 500</td>
<td>14.0%</td>
<td>18.0%</td>
<td>0.56</td>
</tr>
<tr>
<td>Lehman Bond Index</td>
<td>4.7%</td>
<td>3.8%</td>
<td>0.21</td>
</tr>
<tr>
<td>NCREIF</td>
<td>12.0%</td>
<td>1.5%</td>
<td>5.33</td>
</tr>
<tr>
<td>Wilshire REIT Index</td>
<td>0.4%</td>
<td>14.2%</td>
<td>-0.25</td>
</tr>
<tr>
<td>Gilberto Levy</td>
<td>5.9%</td>
<td>2.6%</td>
<td>0.77</td>
</tr>
<tr>
<td>Mortgage CMBS</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.2.2 - INCREASED CAPITAL MARKETS DISCIPLINE

Real estate is often referred to as the last inefficient frontier, where the perception largely remains that tax-driven projects and lax underwriting can result in chronic over-building, regardless of supply/demand fundamentals. Investor's memories of the Reagan-era development boom and the subsequent RTC fire sale have conspired to taint the asset class in the eyes of many institutions. Steve Roth (Chairman of Vornado) corroborated this perception when he said that "we learned...what can happen to the entire economy of the entire country when the real estate industry and the finance industry...gets a little bit out of kilter. We almost had a depression in this country". 8

The confluence of both ill-advised Federal legislation and private sector myopia that resulted in the real estate crash have, of course, been analyzed and commented upon from multiple viewpoints over the last 10-15 years. The relevant issue in this regard however, is the extent to which the industry has learnt from the mistakes of the past and has the mechanisms in place to reduce the likelihood of a repetition. As Mort Zuckerman, CEO of Boston Properties stated, "just because it happened in the 1980's, doesn't mean it is going to happen again in the 1990's. In fact, the general instinct is not to repeat the mistakes you made before, but to come up with new ones!" 9
The influence of Wall Street on the sector has been dramatic in recent years. Initially attracted by the bargain basement prices offered by the beleaguered RTC ("Really Truly Cheap" as one investor observed), the investment bankers teamed up with real estate veterans and other formerly busted developers to pick up the bargains. Bad loan portfolios were either converted into equity positions or alternatively, pooled together into CMBS packages and sold to commercial paper investors. Direct equity interests purchased for cents on the dollar were often grouped together into appropriate geographic or sector portfolios and, along with re-energized management teams and recapitalized balance sheets, taken to Wall Street to do the REIT IPO roadshow. From the early RTC acquisitions in 1991-92, through the CMBS and REIT exit routes in 1993-97, Wall Street’s rescue operation ran smoothly, and profitably. It was then time for the industry to stand on its own two feet again.

From around 1997-98 onwards, the major institutional investors began to recognize that the sector had "emerged from the last cycle as a more sophisticated asset class". Wall Street’s cost of capital penalties for excess capacity has kept new construction levels broadly in line with demand. Commenting on the perceived over-building in the extended stay hotel market in 1998, Barry Sternlicht (CEO of Starwood Hotels) commented "the fact that those stocks (undertaking the development) have come down...means that they cannot easily access capital...some of them have come to us (in
order to joint venture the project); we said, we will see you when your stock is down to $3 (!). The markets will correct in all the sectors for overbuilding and it will slow people down".11

The new, direct link that has been forged between the mainstream capital markets and the previously independent world of real estate was best illustrated during the Russian debt crisis of late 1998. During this period, when credit spreads over Treasuries widened considerably, the real estate sector was effectively held back from undertaking new capital projects, along with the rest of the broader markets. Even privately-held developers, who notionally had little to do with the transparent world and real time pricing of REITs or CMBS, were prevented from undertaking risky schemes by the rising cost of both debt and equity capital. Finally, institutional investors were starting to believe that the real estate sector could become a sophisticated and more disciplined area in which to invest.

1.2.3 - REDUCED VOLATILITY
The volatility in the stock and bond markets in 2000-2001 has greatly increased the relative appeal of real estate as an asset class, given the greater stability of returns provided from private (as opposed to public) real estate assets. Even taking into account the fact that total real estate returns are generally measured by periodic
valuations (as opposed to either real time pricing, or actual dispositions of assets) which are prone to smoothing effects, the relative stability of real estate is seen as a distinct advantage to a mixed-asset portfolio.

1.2.4 - STRONG CURRENT INCOME
One of the principal appeals of real estate as an asset class historically has been its’ high relative current income compared to stock dividends. Dividend yields on the S&P 500 have declined steadily during the last 70 years, especially since 1981 onwards. The last time dividend yields (an approximate equivalent of cap rates) were in excess of 4.0% was in 1991; indeed at one point during the run up in the S&P 500 in 2000 they threatened to dip below 1.0% for the first time ever.¹²

Currently, dividend yields on the S&P 500 are at sub-1.5% levels, having been below 2% consistently since 1997 onwards. The high current income element of real estate provides investors with ‘fat’ running yields compared to both stocks and, to a lesser extent, bonds. The total return of a core real estate investment with modest or no leverage has historically averaged around 11%-13%. Around 75% of this total return element is recognized as current cash flow, an appealing characteristic for many investors, especially those (such as mature pension plans) with high payout liabilities.
2.0 Modern Portfolio Theory and Real Estate

Note: Modern Portfolio Theory ('MPT') is taken in the context of this paper to mean the collective theories on the performance of various asset classes that make up the capital markets, that have gained the most acceptance by the leading investors and advisors on Wall Street. Clearly, the volume and nature of these theories, articles and proponents is an ever-changing field of investment research and could never be described as a 'complete' or 'definitive'. Most academics and investors who think about MPT in their professional lives have no doubt that it will look very different in 10 years time from where it is today.

The reason that MPT doesn't always sit comfortably with real estate is primarily because MPT was not designed with real estate in mind. One of the fundamental differences between real estate and almost all other asset classes (other perhaps than 'art'), is that real estate by its very nature is a heterogenous asset, whereas stocks and bonds and options are all homogenous. The 'lumpiness' and capital intensive nature of direct real estate contrasts sharply with the extreme liquidity of stocks and bonds.

By way of example, there are currently outstanding approximately 5,200,000,000 ordinary shares of Citigroup, all of which on any given day can be purchased for the
same price that will yield the same total return. The beta of the stock is calculated on a continuing basis and is available to anyone with access to the web or a Bloomberg screen. Purchasing one, ten, or ten thousand shares would take approximately 30 seconds, assuming one had either a broker, a telephone or a laptop. Purchasing one million shares might take half a morning. That is a liquid asset.

By contrast, there is only one Citigroup Center, which is one of the 40 tallest buildings in the world, one of the 20 tallest buildings in the United States, the 6th tallest building in New York and the 3rd tallest building in Midtown Manhattan. Since its completion in 1977, it has traded only three times, the last time back in April 2001. It was purchased for $755 million, including $525 million of senior debt. The two joint venture equity owners, Boston Properties (a REIT) and Allied Partners (a private family trust), as well as Deutsche Bank (the lead mortgage lender), worked on the pricing, debt financing, equity raising, priority return structure and due diligence for 6 months. The beta of the asset, assuming it could be calculated with any certainty, is largely irrelevant except for appraisal purposes. All else equal, the new owners may continue to hold the property for somewhere between five and fifteen years. That is an illiquid asset.

Despite the obvious differences between real estate as an asset class and its more liquid, real time competitors, there are elements of MPT that are highly relevant to real
estate. Just because the beta on an individual piece of property is, (unless traded) a theoretical exercise, it doesn't mean that the asset class can 'bury its head in the sand' and pretend that MPT does not apply. Indeed, it is only by attempting to integrate MPT with real estate, that the asset class can continue to be held by large institutional investors with any degree of comfort. This chapter attempts to summarize the main elements of MPT and how, in theory, they might apply to real estate.

2.1 DIVERSIFICATION

In his 1952 paper 'Portfolio Selection', Markowitz was the first to propose that there was an inextricable relationship between risk and return. The relationship between the two elements was quantified in his 'Efficient Frontier'. The most efficient portfolio is the one that gives the highest return for a given level of portfolio risk (or a given level of standard deviation). An inefficient portfolio is one that exposes the investor to a level of risk without a corresponding level of return.

In 1959, Markowitz published 'Portfolio Selection: Efficient Diversification of Investment', in which he proposed that the most appropriate measure of risk was Standard Deviation, or the 'variation' (or distance) from the average. In short, the greater the volatility of an asset, the more risky it is. Markowitz went further to propose
that, although variance may provide a gauge to the riskiness of an individual stock, the average of 2 variances (or 100 variances) will not provide an answer to the riskiness of a 2 stock (or 100 stock) portfolio. Markowitz found a way to determine the riskiness of the entire portfolio, by measuring the ‘Covariance’ of its components. The key to reducing the risk of a portfolio was to diversify amongst assets with appropriate (low) covariance. Bingo, MPT was born.

In respect to real estate, there are two ways to approach the concept of diversification. The first is to assume that real estate itself is merely one of a number of different asset types in a mixed-asset portfolio, and that the correlation of the entire asset class should be measured with other asset types (e.g.: stocks and bonds). Susan Hudson-Wilson of Property & Portfolio Research commented that “as fiduciaries they (pension funds and life companies) need to be in real estate because it is the number one diversifier, the number one risk mitigator for the aggregate portfolio. You can take all four quadrants now – lots more ways to play, with different characteristics attached to them”.

The widely held belief that real estate is a ‘lagging indicator’ (as opposed to a ‘leading indicator’) is one of the reasons for the low correlation of real estate with both stocks and bonds. This is illustrated in the following graph (source: Jones Lang LaSalle):
The second means of approaching diversification is to consider diversification within real estate, as opposed to diversification with real estate. This concept assumes perhaps that real estate is the only asset class being held and that an appropriate mix of assets needs to be put together in a portfolio. Clearly, by way of example, this could be done either on a sector basis (CBD office vs. Multi-family), a geographic basis (Rustbelt vs. California), a national vs. international basis (US vs. Hong Kong) and a 'product type' basis (AAA-rated CMBS vs. equity in a development project).

However, despite the wide acceptance of many elements of MPT (including diversification) by investors, it is important to play devil’s advocate with the main
assumptions that underpin MPT. (Indeed, from a real estate perspective, that is 

to fundamentally the subject of this paper). Warren Buffett, the great value investor who runs 

Berkshire Hathaway and, according to Forbes magazine, the second richest individual in 

the world (behind Bill Gates) with a net worth of approximately $32 billion, is a fierce 

opponent of many elements of MPT. Buffett once stated that “diversification serves as 

protection against ignorance. If you want to make sure that nothing bad happens to 

you relative to the market, you should own everything. There is nothing wrong with 

that. It’s a perfectly sound approach for somebody who doesn’t know how to analyze 

businesses”.4

2.2 CAPM AND APT

In 1963 Bill Sharpe published ‘A Simplified Model of Portfolio Analysis’, which built on 

Markowitz’s work on covariance. Sharpe contended that all securities bore an 

underlying relationship with some factor (the ‘base factor’) which was the single most 

important influence on the behavior, or pricing, of the security. According to Sharpe, 

the base factor for stock prices was the stock market itself, measured in terms of ‘Beta’.

Sharpe also invented the Capital Asset Pricing Model (‘CAPM’). This model suggested 

that the expected risk premium for a security varies in direct proportion to beta, or its 

volatility. The CAPM formula, which defines this relationship, can be written as follows:
Expected risk premium on a stock = Beta x Expected risk premium on market

or,

\[ r - rf = B (rm - rf) \]

therefore,

Expected return on a stock = rf + B (rm - rf)

where, \( r \) equals expected return on a stock, \( rf \) equals the risk-free rate, \( B \) equals the beta of the asset, and \( rm \) equals the return on the market portfolio.

In a CAPM 'world', investors are happy to invest in just two asset types; Treasury bills and the market portfolio. The allocation between these asset classes will depend upon investors appetite for risk.

A further development on the question of how to best calculate the risk premium on an investment was the introduction of Arbitrage Pricing Theory ('APT'), first aired by Stephen Ross in 1976. Instead of attempting to answer which portfolios are most efficient (a central question of CAPM), APT starts by assuming that each stock's return depends partly on pervasive macroeconomic influences or 'factors', and partly on 'noise' - events that are unique to that stock. APT doesn't state what the factors are; they depend on the market in question. For example, oil prices will effect Exxon stock more
than Disney, and changes in the mortgage rate will effect Equity Residential more than Coca Cola.

APT states that the expected risk premium on a stock should depend on the expected risk premium associated with each factor and the stock’s sensitivity to each of the factors (b1, b2, b3, etc). Thus the APT formula is:

\[
\text{Expected risk premium on investment} = r - rf
\]

therefore

\[
r - rf = b1(r \text{ factor1} - rf) + b2(r \text{ factor2} - rf) + ...
\]

The APT is similar to CAPM in that they both state that in well diversified portfolios, expected returns are affected by economywide influences (i.e.: systematic risk), and not by unique risk. In other words, if the factors and their weightings in the APT model were similar to the portfolio’s market beta, then the APT model and the CAPM would give the same answer. In essence, APT allows investors to construct factor influences for each stock, whereas CAPM collapses all macroeconomic risk into a single factor – the return on the market portfolio.
The extent to which valuation models based on CAPM, APT, the Three Factor Model or any other MPT variant permeate down to actual corporate transactions is certainly a matter of debate. The consensus amongst the leading advisors and underwriters on Wall Street appears to be that corporate and asset valuations remain based upon three basic steps, namely the discounted cash flow model (providing the fundamental pricing mathematics), which is then 'cross-checked' by the comparable analysis (i.e.: comparing the various multiples in a deal with recent and similar transactions), and finally the consequences impacts (i.e.: estimating the extent to which a deal will be either accretive or dilutive).

Bruce Wasserstein (founding partner of Wasserstein Perella, now part of Dresdner Kleinwort Wasserstein, and a 30 year M&A veteran) explains the relationship between MPT and Wall Street thus, “sophisticated companies don’t pay the same attention to theoretical financial models as newly minted MBA’s...Essentially, every five years a bright business school professor or economist comes up with a new twist on corporate finance theory and publishes it in the ‘Journal of Finance’ or some other academic periodical. It filters down, often through consultants and bankers, to corporations who adapt variant forms of the theories. But it’s all theoretical as hell, so naturally the models get adapted and tangled. As long as it’s all taken with a grain of salt, the exercises are worthwhile.”
2.3 SHARPE RATIOS

A basic assumption of almost all studies of the relationship between risk and return is that 'risk' is adequately represented by the volatility, or standard deviation, of the returns over a given period. This formula (first developed by Bill Sharpe in 1966) is known as the Sharpe Ratio and is calculated as follows:

\[
\frac{(\text{Investment return} - \text{risk free rate})}{(\text{Standard deviation of return})}
\]

This formula could be regarded as measuring the 'bang for the buck' on an investment, or the excess return per unit of risk. Assuming that the risk-free rate is a constant, then the numerator varies only because investors require higher returns for riskier investments. The denominator is another measurement of the same phenomenon; risk. If these are both valid measures, the relationship between them should be constant, they should change together as risk changes, and the Sharpe Ratio should be a constant.

Research undertaken by The Dilmore Group shows that over the very long term, this is the case. The results showed that over a 71 year period (1926-1996), the Sharpe Ratio for both large cap, mid cap and small cap stocks were all very close to 0.40. These
figures demonstrated that volatility or standard deviation is a generally stable measure of risk,...assuming that an investor had an investment horizon of over 70 years (!). As The Dilmore Group research paper states, "if we can hold an investment for 70 years, the bang for the buck, or return per unit of risk, will turn out to be about the same...however, for short investment horizons we see wide fluctuations in the Sharpe Ratio". 8

Notwithstanding the problems that can be encountered when using the Sharpe Ratio, it remains a popular measure of risk-adjusted returns for many institutional investors. (See Chapter 1.2.1 ‘Attractive Current Valuation’, for a discussion on the relative attractiveness of real estate based on Sharpe Ratios).

A biting critique of both the CAPM approach and the underlying theory behind the Sharpe Ratio was given once by Warren Buffet. Buffett states “we bought The Washington Post Company at a valuation of $80m in 1974. If you’d asked any one of 100 analysts how much the company was worth when we were buying it, no one would have argued about the fact that it was worth $400m. Now, under the whole theory of beta and modern portfolio theory, we would have been doing something risky...even though it was worth $400m, because it would have had more volatility. With that, they’ve lost me”. 9 (One can almost hear the real estate vulture funds such as Whitehall,
Apollo, Blackstone and JE Robert, echoing that exact sentiment during the RTC era of the early 90’s). Later, Buffett went on to state that “the academic’s definition of risk is far off the mark, so much so that it produces absurdities”\(^\text{10}\). For Buffett, a drop in price actually reduces risk, as opposed to increasing it because of the volatility.

### 2.4 EFFICIENT MARKET THEORY

The theory behind the proposition that capital markets are, to varying degrees, essentially efficient, was begun with a paper delivered by Maurice Kendall in 1953. Kendall had begun his research into stock and commodity prices expecting to find regular price cycles, but to his surprise, they did not exist. Kendall stated that prices seemed to follow a ‘random walk’, because successive changes in value are independent of previous valuations. (Kendall’s work was subsequently built upon by Eugene Fama in the 1960’s, who wrote about the “rational profit maximizers” who instantaneously ‘close down’ any arbitrage opportunities).

The central tenet of Efficient Market Theory (‘EMT’) is that capital markets are competitive, in the sense that genuine, pure arbitrage is not possible due to the existence of many intelligent investors who will move quickly to correct any imbalances in pricing.
There is widespread research available which purports to prove the notion of EMT, most of it relating to the inconsistent returns of (individual) mutual funds over the long run. As a result of the widely held belief that it is impossible to ‘beat the market’ on a consistent basis, corporate pension plans in the US now invest over a quarter of their US equity holdings in Index tracking funds that mimic the performance of the market portfolio.

It was at the University of Chicago during the 60’s and 70’s that the philosophy behind EMT was honed. Academics such Eugene Fama, Merton Miller and Myron Scholes developed the premise that stock prices were always “right”, and hence no one could predict future prices, which were therefore always “random”. As Lowenstein stated in ‘When Genius Failed’ (the inside account of the demise of Long Term Capital), “in effect, the hypothesis (EMT) assumes that every trading floor and brokerage office around the world – or at least enough of them to determine prices – is staffed by a race of calm, collected traders, who never pay more, never pay less than any security is worth...the disciples of the Random Walk Cosa Nostra...methodically rejected any suggestion that markets could err”.11

Perhaps not surprisingly, it is the investors who have consistently delivered exceptional returns in many asset classes over many economic cycles that are the most scathing
critics of EMT. To the skeptics of EMT, these investors are living (billionaire-status!) proof that EMT is flawed in some respects. (To its defendants however, they are simply the tail end of the distribution curve). The main issue that Warren Buffett has with EMT is that it makes no allowance for investors who analyze all the available information and gain a competitive advantage by doing so. Buffett’s simple critique of EMT is explained thus, “observing correctly that the market was frequently efficient, they (Long Term Capital) went on to conclude incorrectly that it was always efficient. The difference between these propositions is night and day”.\textsuperscript{12}

George Soros, the famed international fund manager who runs Soros Fund Management and the Quantum Group of Funds, seemed to have exactly the same philosophy towards EMT as Warren Buffett did, when he responded to a question as to why he didn’t employ “scientific quantitative methods” in his investing style. Soros explained, “because we don’t believe in them. They’re generally constructed on the assumption of EMT. That theory is in conflict with my theory of imperfect understanding...I think those (EMT) methods work 99% of the time, but they break down 1% of the time. I am more concerned with that 1%...I am particularly interested in discontinuities and I find that those measurements (EMT) are of little use to me”.\textsuperscript{13}
Writing in 1986, Sam Zell, the leading real estate investor, was essentially pouring disdain on the whole concept of EMT existing in the direct real estate market when he stated, "conventional wisdom made the acquisition of the Uris properties by Olympia & York in 1976 the single best acquisition of the last decade. Would the indexes of real estate valuation in 1976 suggest this was the appropriate time to commit funds to New York office space? Would an assessment of comparables in New York have supported the purchase? Clearly none of these tests would have endorsed this move. Yet the results of that acquisition have been spectacular".14

No discussion of EMT would be complete without at least a mention of a newer philosophy that is gaining ground in capital markets as a way of explaining the 'disconnects' that often appear in prices. This work, a blending of economics and psychology, is known as Behavioral Finance ('BF').

Essentially, BF seeks to explain market inefficiencies by applying psychological theories. The main elements of BF include the following notions:

i) **Overconfidence**: people in general are overconfident. These types of investors not only make foolish decisions in the capital markets for themselves, but also have a powerful effect on the market as a whole. The
overconfident investor typically relies on information that confirms what they already believe, and they disregard contrary information.

ii) **Overreaction bias**: Thaler (one of the first economists to study BF) believes that often investors will put too much emphasis on a few chance events, thinking that they have spotted a trend. Furthermore, behaviorists have learnt that people tend to overreact to bad news and react more slowly to good news.

iii) **Loss Aversion**: Thaler points to studies that show that on a 50/50 bet, with precisely even odds, most people will not risk anything unless the potential gain is twice as high as the potential loss. This is known as asymmetric loss aversion, where the downside has a greater impact than the upside.

iv) **Risk Tolerance**: people’s tolerance for risk is founded in emotion, which changes with circumstances. When the market declines drastically, even investors with an aggressive risk profile will become very cautious. In a booming market, both aggressive and supposedly conservative investors add more stocks.

v) **Lemmings and Mob Mentality**: according to studies on the animal kingdom, lemmings are small rodents indigenous to the tundra region, and are noted for their peculiar, self-destructive mass exodus to the sea. As one equities trader observed, “a bit like fund managers, only fund managers are better paid.” Watching the behavior of lemmings gives students of BF a
glimpse into the psychology of crowd behavior, which is a critical factor in the capital markets.

Robert Hagstrom, Senior VP at Legg Mason Fund Management, observed that “stocks with the highest percentage of institutional ownership are often the most volatile in price. The wild swings in share prices...have more to do with the lemminglike behavior of institutional investors than with the aggregate returns of the companies they own”.

Warren Buffett believes that the ‘safe’ strategy of index tracking is grounded in this particular element of BF. As Buffett stated, “failing conventionally is the route to go; as a group, lemmings may have a rotten image, but no individual lemming has ever received bad press”.

George Soros also had a view on the lemminglike behavior of investors, but also at the same time was cautious of the power of the market. He explained that “I am often considered a contrarian. But I am very cautious about going against the herd; I am liable to be trampled on. According to my theory of initially self-reinforcing, but eventually self-defeating trends, the trend is your friend most of the way; trend followers only get hurt at inflection points, where the trend changes...the prevailing wisdom is that markets are always right. I take the opposite position. I assume that markets are always wrong...most of the time we are punished if we go against the trend. Only at an inflection point are we rewarded.”
3.0 Constructing the Risk Premium in Real Estate

Peter Bernstein, author of 'Against the Gods: The Remarkable Story of Risk', wrote recently in the Financial Times, “if we never know the future, we never know the future! When we think we know, we are setting ourselves up for trouble...view uncertainty as a constant rather than a variable...while no one would dispute JP Morgan’s maxim that capital markets will fluctuate, there is no predestined mean to which markets must recover...we are stuck with uncertainty. Mastery of investment begins and ends with that, perhaps the only fact in the whole matter.”

If “uncertainty” is “perhaps the only fact in the whole matter”, then choosing the discount rate is perhaps the single most important decision in investment. The incorrect use of the discount rate can lead to catastrophic results for the naïve investor who, for example, uses the company cost of capital as a discount rate on a project that is more risky than average. As one Stanford professor told his MBA students, “internal rate of return is the most dangerous weapon ever developed in the United States”(!).

According to Brealey and Myers in 'Principles of Corporate Finance', “the true cost of capital depends on the use to which the capital is put”, in other words, the correct discount rate for projects must relate to the riskiness of the project itself, as opposed to
the cost of capital of the buying entity. The relationship between CAPM (which is one of the key components in deriving the cost of capital for a firm) and the cost of capital rule is set out in the following graph (source: Brealey & Myers):

The discount rate, or the investor’s aspired rate of return, can be divided into three separate components:

i) the rate necessary to neutralize (compensate for) the investor’s perception of inflation over the life of the project

ii) the rate necessary to provide the investor with a risk-free return

iii) the rate necessary to give the investor a risk premium, dependent upon the riskiness of the project being undertaken

In respect of the inflation element, an investor’s perception of the inflation that may occur during an asset’s holding period is a key component of the investor’s aspired rate
of return. In this sense, inflation can be thought of as the ‘generalized devaluation of
the dollar’.

In respect of the risk-free return element, market participants typically use US
Government securities as a proxy for the risk-free rate. If held until maturity, the only
risk inherent in these securities is that of inflation.

The risk premium element is the return which compensates the investor for the
business risk element of an asset. This risk premium is added to the two previous
return elements (i.e.: inflation-protection plus the risk-free rate). It is likely that the
measurement of the risk premium is not a science at all, but more of an art. As one
commentator drily observed, “man’s ability to perceive and estimate uncertainty is not
developed, and his intuitive abilities to process uncertainty to reach conclusions are
virtually nonexistent”.

Once the hurdle rate has been derived using the above three components (inflation
risk, risk-free return plus the risk premium), the investor makes a judgment as to
whether an asset is likely to deliver that kind of return. Investment occurs when the
investor perceives that the return from the asset will either meet or beat the hurdle
rate. On paper, that can be a relatively easy judgment to make; however, the critical
component is to make the correct assessments about both the cost of capital, and the likely future performance of the asset. Stripping away all the finance theory that goes into constructing the discount rate, it is likely, as a University of Texas professor observed, that “most of the mathematics of risk was left to the four horsemen of the implicit decision making apparatus; judgment, hunch, instinct and intuition”.

\[5\]
4.0 Cost of Capital, Capital Structure and MM Theory as it pertains to Real Estate

In a perfect market, Modigliani and Miller argued that the value of the firm or an asset is unaffected by its choice of capital structure. This belief was set out in two separate (but linked) propositions, which essentially underpin the starting point for the question of debt-equity mix in corporate finance. The first proposition, known as MM I, states that “the market value of any firm is independent of its capital structure”.¹ This theory was based on the premise that any investor could effectively replicate the returns of a levered asset or firm by borrowing themselves, and then buying into an unlevered equivalent. It is important to stress that this law of financing is dependent upon the existence of perfectly efficient capital markets; as Brealey and Myers state, “we cannot say “the value of a pie is independent of how it is sliced”, if the slicer is also a nibbler”.²

The second proposition, MM II, states that the expected rate of return on equity of a levered firm (or asset) increases in proportion to the debt-equity ratio. In other words, the greater the amount of leverage, the greater the amount of risk, and hence (in perfect capital markets) the greater the required return on the equity. MM II is closely linked to the pre-tax weighted average cost of capital (‘WACC’), in the sense that the
return on an asset remains constant, despite changes in the debt-equity mix that finances it.

It is important to note that some investors believe that the MM propositions, whilst being broadly correct, do need to allow for some subtleties that occur in the real world. These investors contend that whilst a moderate degree of financial leverage may increase the required return on equity, it is not to the degree predicted by MM II. Conversely, irresponsibly-financed assets that contain high amounts of risky debt find that the required return on equity shoots up faster than MM predict. As a result, the WACC declines at first, then rises rapidly, allowing for a situation where a modest degree of leverage is the optimum capital structure for a firm (or asset). The rationale behind this argument is that either: i) investors do not notice (or care) about a modest quantum of debt, and/or ii) that investors actually prefer the leverage to be taken on at an entity level (as opposed to replicating the leverage themselves), due to the inefficiencies in the capital markets.

This school of thought also points out that MM is violated when innovative financing techniques actually add fundamental market value to the firm or asset, by providing investors with products that cannot be purchased elsewhere. An example of this situation occurring in the real estate markets was when the CMBS markets began to
develop in the mid-90’s, where real estate investors began to tap the US commercial paper market for lower overall debt costs by slicing and dicing the income streams to meet investor requirements. However, in efficient market conditions, it is likely that these innovations will get replicated to the extent that the ‘extra value’ is then subsequently lost.

The arguments discussed above on capital structure have not touched upon the subject of taxes, a key component of the relative attraction of real estate as an asset class. (The tax deferral benefits of real estate are touched upon earlier in ‘Why Invest in Real Estate?’, Section 1.1.3). A succinct position on this issue was stated by Stewart Myers thus: “the choice of capital structure...boils down to taxes, risk and asset type. For example, a safe, consistently profitable company with few intangible assets or growth opportunities ought to find a relatively high debt ratio attractive. A risky growth company ought to avoid debt financing, especially if it has other ways of shielding its income from taxes”.

In respect to real estate, the combination of tangible assets (i.e.: bricks and mortar, as opposed to say, human capital), long term income streams, and large lot sizes has led to a situation where debt makes up a significant proportion of total real estate capital in the US. The latest Lend Lease/PWC figures estimate that around 80% of the total
institutional real estate market is in the form of debt securities ($1.55 trillion of real estate debt out of a total institutional market of $1.93 trillion). The real estate sector, by the very nature of the assets supporting it, has always supported a significant amount of debt within the capital structure.

However, it is not just because of the tangible, stable nature of the collateral that debt plays such an important role in the sector. Considerations such as tax are also a crucial issue for both buyers and sellers, as well as the relative cost of debt that owners perceive may not be available in the future. Mort Zuckerman, CEO of Boston Properties, explained his view on leverage thus, “often when we buy properties today, in order to protect the tax position of the seller, we have no choice but to lever up. When we agreed to buy Prudential Center we had to put $300m in financing in order to buy it. It was a requirement of the sale. The same thing is true with Embarcadero in San Francisco...so...we find ourselves to some extent leveraging up. We are borrowing money (in June 1998) at between 6.6%-6.8%, ten year and twelve year money, and frankly we are very comfortable with that. I would rather leverage up in this environment and not worry about it two or three years from now. If you can’t make those kinds of judgments as a company, you shouldn’t be in business”.


In many cases, it is the implicit risk that comes with debt that appeals to the high yield investor. When George Soros was asked if he was able to quantify to what degree leverage had contributed to the investment success of his funds, he replied as follows: “That is a question I cannot answer. The Quantum Fund would have been a totally different animal because many positions we take make sense only because we use leverage. If it couldn’t be leveraged, we wouldn’t be making that particular investment.”
SECTION B: THE REALITY

5.0 The ‘Other’ Asset Class: why Real Estate never conformed

The first section of this paper ('The Theory', Chapters 1.0-4.0 inclusive) dealt with the gradual evolvement and acceptance of MPT within the capital markets (as well as the degree to which MPT could be applied to real estate). In general terms, the key theories and papers that make up classical MPT were written between the early 1950’s and the mid 1970’s; their acceptance and adoption by Wall Street was a gradual process that essentially began in the inflationary environment of the 1960’s, and then became ‘even more essential’ during the rolling recessions of the 1970’s. The vast majority of MPT theory translated easily to the stock and bond markets; indeed, the whole study of MPT was essentially based around those markets.

It was during the 1970’s that real estate became the third major asset class in institutional portfolios, driven by its inflation-hedging qualities, its low correlation and aided considerably by both the passage of ERISA in 1974 and the establishment of the NCREIF Index in 1977. Hence, MPT (or rather, the practitioners of MPT) tried to apply their fiduciary mindsets to real estate; an asset class that was, and to a very large degree remains, fundamentally ‘different’. 
In particular, it is the heterogenous nature of private equity real estate that results in the whole notion of Efficient Market Theory ("EMT") being difficult to apply to the asset class; every transaction in the private market is different and individual properties perform very differently, even if they are located adjacent to each other. In addition, MPT assumes that there is 'perfect liquidity' in the asset class and that portfolios can be costlessly and quickly rebalanced; this is clearly not the case with real estate. Lastly, MPT also assumes that there is no principal-agency structure associated with the asset class, thereby ignoring the reality of high fees and potential conflicts of interest.

Despite the realities of dealing with this lumpy, slow moving and information-deficient asset class, institutional involvement in the sector was largely driven by asset allocators, who were attracted by the seemingly high risk-return characteristics of real estate. As Riddiough commented, "it is important to keep in mind that the rationale for institutional investment in commercial real estate is based on the passive risk management arguments of portfolio theory. The rationale is not based upon opportunistic investment rationales that rely on a search for market inefficiencies...the assumptions of portfolio theory must be satisfied (to some level of approximation) for diversification benefits to be realized".1
Timothy Viezer, writing in 'Real Estate Finance', stated “it was probably a real estate professional that first quipped "if one says MPT quickly, it sounds like empty". Unlike their colleagues in the stock and bond markets, institutional real estate investors have been reluctant to adopt the techniques of MPT...the most important reason for MPT’s rejection by real estate practitioners...is MPT’s abstraction from the traditional real estate decision-making process”.2

Sam Zell (typically), was more blunt. He stated, “using numerical analysis on real estate and conversion of the investment vehicle to a performance vehicle, reflects a naivete that can only lead to disaster. The proliferation of non-real estate thinking individuals in the business has created performance indexes that border on the ludicrous. The idea that a localized market...can be realistically valued and incorporated into a meaningful nationwide measuring system does not make sense. The concept of quarter to quarter valuation of brick and mortar generates numbers only relevant to institutional investors, who demand tables comparable to those used in stock market investment”.3

In essence, Riddiough, Viezer and Zell were all saying the same thing; real estate is different, it is slow moving, and it is certainly not a 'perfect market'. Applying the strict parameters of MPT to real estate is like trying to put a straight jacket on a 400lb grizzly bear; it is futile, it is silly, and perhaps most importantly, you will get hurt.
6.0 Investor Types; a Commentary on the Reality of Private Equity Investment in Real Estate

In attempting to comment on the extent to which investors in the private equity quadrant of real estate utilize MPT, it is necessary to ‘ask the question’ of multiple investor types. Asking the question to the head of investment management at a major life insurance group or pension fund with a diverse mix of public and private real estate assets across both the US and internationally, is likely to yield a different set of responses from that of a local developer who specializes in one particular sector.

Tom Wolfe’s fictional commentary on modern Atlanta society, ‘A Man In Full’, depicted two distinct types of personality in the real estate business. The first type, ‘Charlie Crocker’, was the local developer-trader, the old-school mogul who “knew what a DCF was, but exactly how you picked a number to discount it at, he could never figure out”. The second type was his young chief financial officer, ‘The Wiz’, who “was all MBA youth...and by his voice you couldn’t tell where he was from, unless it was the Wharton School of Business”.

The old-school developer in the book, Crocker, goes spectacularly bust in the real estate crash of the early 90’s, but Wolfe (unsurprisingly!) does not go on to describe
the legacy of that period from a real estate perspective. The point is that the real estate sector is now (post-RTC) much more closely aligned with the mainstream capital markets, and yet, at the same time, is still its own distinct and different asset class. Whilst participants such as The Wiz have helped the sector become more efficient, the simple fact is that major redevelopment projects (both successful and unsuccessful) would simply not happen without the Crocker-types, driven by what Anthony Downs called, “their own hubris and ego”.²

The extent to which MPT can be applied to the sector is discussed by the four different investor types below.
6.1 INVESTOR TYPE: THE REIT

Background: Simon Property Group ('SPG') is the third largest REIT by equity market capitalization (at $6.5 bn), and the largest owner of regional shopping malls in the US. SPG owns 250 malls in 36 states totaling 185 million sq ft of prime retail space, as well as a controlling interest in a pan-European retail developer. SPG both develops its own regional malls and urban entertainment centers, develops in joint ventures with other specialist retail developers, and acquires and manages existing mall assets. Amongst the better known assets in the SPG portfolio are The Mall of America, The Mall of Georgia and The Forum Shops at Caesars Palace.

SPG have essentially built the dominant super-regional mall franchise in the US. In addition to the core rental income from its portfolio, SPG have developed a series of additional business lines which are linked to the retail business, including in-mall marketing strategies and retailer internet services. Over 2 billion shopping visits are made to their properties each year.³
Comments: It is on the issue of ‘cost of capital’, or WACC, that the difference between finance theory and the ‘real world’ becomes most apparent. In short, it appears as if most operators in the REIT industry are unable to even agree on a clear definition of WACC. In May 1998, Paine Webber hosted a REIT conference that touched upon the issue of WACC. The following exchange took place between Jon Litt (Senior REIT analyst at Paine Webber) and Chuck Berman (President, Avalon Bay Communities):

Jon Litt: “how do you evaluate acquisitions? Is it on the basis of: a) immediately accretive, b) buying futures, c) long term strategic fit, i.e.: not accretive, or d) returns greater than cost of capital?”

Chuck Berman: “I sat in a room with 30 developers...and no one could agree on the definition of what revenue was, so, it was pretty hard to agree on a definition of cap rates and I think agreeing on whether you are returning more than your cost of capital is harder. It is probably all these things (i.e.: a) to d) above).”

Given the lack of consensus amongst both leading REIT management and the Wall Street analysts who cover them, it is perhaps not surprising that SPG regard their ‘true WACC’ on a different basis from that of the REIT analysts. Recent research from Merrill Lynch (dated May 2001) suggested that the estimated total return on SPG’s common stock (i.e.: the cost of equity capital) was around 16%, based on “an 8% expected price appreciation combined with the 8.1% dividend yield”. However, Rick Sokolov (the COO of SPG) argued that a better measure of cost of equity was to look at the forward
FFO multiple, especially for stocks (such as SPG) that "never intend to issue equity again". (The forward FFO multiple is essentially the REIT equivalent of the forward P/E ratio, given that FFO is an 'adjusted' EBITDA for public real estate companies).

On the basis of Sokolov’s rationale, with a forward (2002) FFO multiple of around 7.6x, SPG’s cost of equity is therefore 13.16% (i.e.: the inverse of the FFO multiple). The current average cost of SPG’s debt (rated at BBB+) is around 7.9%, with a leverage ratio of 55%. This translates into a WACC for SPG (according to Sokolov) of 10.25%.

In respect of the hurdle rate for new investment acquisitions, Sokolov explained that SPG typically used a rate of around 10.5%-11.0%, on an unlevered basis. Taking into account debt, this would translate into a typical leveraged return of around 17.0%, considerably higher than SPG’s WACC. This ‘premium’, explained Sokolov, could be crudely thought of as the accretive element in a typical transaction.

Whilst the typical investment acquisitions as described above are made anticipating a 10.5%-11.0% unlevered return, SPG do undertake projects that use (unsurprisingly) a higher discount rate, as well as (perhaps surprisingly) a lower discount rate. Examples of the former category would include development projects (such as SPG’s Penn’s Landing scheme in Philadelphia), where a discount rate of 11.5%-12.0% would be
required. In addition to the higher discount rate that would be used on a risky
development project, SPG would also seek to mitigate an element of the risk by
bringing on board a JV partner. This JV strategy (likely to be employed on the new
'lifestyle mall' concept at Penn’s Landing) is designed to both share the equity exposure
and add either local knowledge or specific retail/leisure expertise.

There are scenarios where SPG would undertake projects at a discount rate that was
lower than their WACC, for example on projects that SPG regard as “defensive”.
Examples in this vein would include either an extension to a mall in order to deprive a
competing mall of an anchor tenant, or ad hoc projects such as the February 2001
purchase of the (bankrupt) Montgomery Ward portfolio, which included 28 anchor
department stores that form part of other SPG properties. SPG decided to take control
of the Montgomery Ward properties in order to control their eventual fate and re-
tenanting.

Finally, it is interesting to note the analogy that SPG use as to why they think their
ongoing franchise value is worth more than simply the sum of their individual parts (or,
in other words, why they believe they should trade at a premium to NAV). David Simon
(CEO) rationalized that “people suggest that we overpaid for Larry Bird or a particular
player, but if you put them all together you have a great basketball team”. Given the
synergies, cost savings and branding that undoubtedly accrue from a collection of
super-regional malls such as those owned by SPG, perhaps the central task of the management is to convince the market of their ‘premium franchise value’, or what Riddiough calls “delta g”. Delta g is a similar concept in the public real estate markets to Brealy & Myers’ PVGO (‘present value of growth opportunities’), which is the often intangible element of a stock price that refers to the collective perception of management’s ability to keep adding value.
6.2 INVESTOR TYPE: THE PRIVATE DEVELOPER-OWNER

Background: M.D. Hodges Enterprises, Inc. ('Hodges') are a classic example of a local, private development firm. Founded in Atlanta in 1958, Hodges initially built Post Offices throughout the southeast. In the late 60's, Hodges began to focus on the development of industrial properties in the Atlanta region, buying up large tracts of raw land and then benefiting from the gradual but consistent growth of metro Atlanta. By 1999, Hodges had built in excess of 15 million sq ft of industrial properties in the area, had accumulated a landbank of over 1,400 acres and had remained throughout that time a family-owned business.⁹

Most of the development expertise that Hodges utilized was in-house, with 45 employees split between real estate management, leasing, development and general contracting. Until recently, Hodges’ capital structure had only minimal amounts of debt, and they retained the vast majority of their portfolio without ever selling. In the best possible sense, Hodges were the perennial ‘old school’ development company.

In 1999 the family decided to sell the company in order to diversify their holdings, and hired Arthur Andersen to advise on the optimum exit strategy, taking into consideration two critical factors; tax, and a desire by the senior management to retain an on-going
role in the business. In early 2000 (after having rejected the possibility of converting their shares into UPREIT units due to the prevailing pricing in the REIT market), Hodges was sold to a New York-based private equity house who specialized in real estate.

**Comments:** Hodges is an interesting example of the conversion of an 'old school', closely-held development firm (no debt, no trading, in-house contracting, always land-banking), into a more modern real estate company (debt, JV development, dispositions, IRR-driven).

Jeffrey Small, CEO of Hodges, is (following the recapitalization with the private equity firm) now focused on delivering equity IRR’s in excess of 20% to the shareholders. The new shareholding in Hodges allows for an 18% priority return to the private equity owner, after which point the Hodges management receive a 10% interest in the remaining profits. Once a 20% return has been achieved, the profit share to the Hodges management doubles, to 20%. In essence, this is designed to ensure that the management is incentivized to consistently edge up the returns on equity from the late-teens to in excess of 20%.10

Small estimates that the WACC of Hodges (after having levered the portfolio with loans totaling 73% of LTV) is in the region of 12%-14%. In general terms, the typical
development project that Hodges undertakes provides an unlevered return in the 10.5%-11.0% range. Development profit and fees enhances this return to around 14%-16%; leverage enhances it still further to around 18%-20%; and finally, any rental growth in the market during the construction period takes the total, levered returns “into the low-20’s”. The IRR hurdles demanded by the new parent company (“time is the new enemy in an IRR world”) forces Hodges to trade a proportion of the projects once they are completed.

In addition, Hodges has branched out from undertaking only industrial development into other sectors, such as suburban office parks, multi-family communities and retail. On large scale, mixed-use projects, JV partners (such as Duke-Weeks, the large Atlanta-based REIT) have been brought in to both share the development risk and provide an eventual exit from the project.

In short, Hodges have made the conversion into a more modern operating company a wholly successful transformation. This has been achieved by taking on-board the most appropriate elements of real estate finance (such as a focus on capital structure, sector diversification and total returns), whilst retaining an eye on the fundamentals of their business (being ‘in the market’, optioning the best land ahead of rival developers, and keeping their tenants happy).
6.3 INVESTOR TYPE: THE OPPORTUNITY FUND

**Background:** Blackstone Real Estate Partners ('BREP') is the real estate arm of The Blackstone Group, a private New York investment bank with $52bn of assets under management. Blackstone co-invest alongside their clients (primarily US pension funds and endowments) in a wide range of sectors including private equity, hedge funds, mezzanine funds and real estate.

BREP currently manages $7.5bn of real estate in the US and Europe, all of which is mandated to be 'high yield' (i.e.: seeking levered pre-tax IRR's in excess of 20%). Since commencing their first Opportunity Fund in 1992, BREP have taken both equity and debt positions in a wide range of real estate assets, including offices, retail, industrial, multi-family, development land and hotels.¹¹

**Comments:** it is patently clear from The Blackstone Group’s corporate brochure that the entire notion of Efficient Market Theory ('EMT') is not widely held amongst the senior management of the firm. Indeed, in explaining the rationale behind the firm’s formation in 1985, the Chairman and CEO portray a distinct unease with the status of the markets during the Reagan era. They explain that “up and down Wall Street, the winds of hostile takeovers were blowing...headlines screamed of...incomprehensible mega-deals. Twenty-something MBA’s were all too willing to endorse client acquisitions...
that defied the basic laws of economic gravity. In some quarters on Wall Street, exotic financial engineering techniques had replaced long-term relationships, careful analysis, strategic thinking, and good judgment".  

Classical EMT is violated even more directly by Blackstone when they state that the firm is “always seeking the best high-return, low-risk uses for our capital”. In a real estate context, one can hardly blame those (fortunate) investors who avoided the sector in the 80’s, but who took advantage of the RTC in the 90’s, for thinking perhaps that EMT really stands for ‘Extremely Muddled Thinking’. In interviewing professionals who work on the real estate funds at Blackstone, their comments are riddled with phrases that refer to “arbitraging the public and private markets”, or “taking advantage of a lack of capital”. It is the very distinct attributes of the real estate sector itself (especially its illiquidity, heterogeneity, lack of reliable information and capital-intensive nature) that allow these inefficiencies to be exploited.

Playing devil’s advocate (if you believed in EMT), one could argue that the reason the Opportunity Funds are able to deliver high returns is because they take on higher risk. However, the levered IRR performance of a number of the Opportunity Funds (consistently in the broad 25%-35% range over a 7-8 year period) suggests that it is possible for a number of investors to achieve superior investment returns in real estate.
Roger Orf, principal of Pelham Partners (a London-based fund that invests on a pan-European basis with US institutions) stated that “the last 10 years have demonstrated that one can successfully rotate through both cycles and continents, seeking out high returns”.

Blackstone state that “real estate, more so than many other industries, is often defined by a ‘herd’ mentality. Much of Blackstone's success to date can be attributed to avoiding this common pitfall by leading rather than following.” Dan Prigmore, principal of the Boston-based Baupost Group (a contra-cyclical investor in the US, Europe and Japan) is scathing about the inefficiencies in the asset market. He explains that “we get out (of our real estate holdings) by capital being envious of the returns that we get. Big, institutional capital never flows until evidence is proven; it always commits right before the buffalo goes off the cliff”.

The philosophy of the Opportunity Funds is essentially based on a view expressed by Lawrence Fiedler, adjunct professor of real estate at NYU, who states, “intrinsic value equals market value only at rare moments of total market rationality. Market values are lower than intrinsic values during periods of forced selling. The RTC...is the most extreme example of such activity. Similarly, market values climb above the calculated intrinsic value when the momentum of market buying leads to irrational expectations and bidding frenzies”.
6.4 INVESTOR TYPE: THE PENSION FUND

Background: State Teachers Retirement Systems of Ohio (‘STRSO’) is one of the largest state pension funds in the US, with over $57bn of assets under management. In 1998-99, STRSO paid out over $2bn in payments to retired Ohio teachers and their dependents. STRSO also provides health care benefits to its members. The pension fund is managed internally (relatively unusual for a large state fund), with over 115 investment professionals based in Columbus, Ohio.17

The $57bn of assets under management and their respective target total returns are divided into eight asset classes as follows:

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Weighting</th>
<th>Target Total Annual Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Stocks</td>
<td>46%</td>
<td>8%-10%</td>
</tr>
<tr>
<td>International Stocks</td>
<td>21%</td>
<td>8%-10%</td>
</tr>
<tr>
<td>US Treasuries</td>
<td>8%</td>
<td>6%-7%</td>
</tr>
<tr>
<td>Corporate Bonds</td>
<td>6%</td>
<td>6%-7%</td>
</tr>
<tr>
<td>Mortgages (Govt. Agencies)</td>
<td>7%</td>
<td>6%-7%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>10%</td>
<td>8%-9%</td>
</tr>
<tr>
<td>Cash</td>
<td>1%</td>
<td>N/A</td>
</tr>
<tr>
<td>Alternative Investments (eg: private equity and hedge funds)</td>
<td>1%</td>
<td>8%-10%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td>8.0% overall</td>
</tr>
</tbody>
</table>

Clearly, out of all the sector types discussed in this paper, the pension funds have by far the lowest cost of capital, given in this context to mean the current annual total
return that is required on their portfolio in order to fully meet the funds’ fiduciary obligations to their stakeholders over the foreseeable future.

In the context of their real estate portfolio, which totals $5.85bn, STRSO are reasonably well diversified. Over $500m (representing around 9%) is held in a REIT account, and a further $500m is held in high yield, international Opportunity Funds. Of the remaining $4.8bn, this is split approximately 70% to ‘core’, Class A assets, with 30% in ‘non-core’, value-added assets. The $4.8bn that is held in the US in private equity is well diversified across both sector types and geographic regions, as well as incorporating a number of JV investments. However, the fund does not hold commercial mortgages, nor does it provide any construction financing.18

In 1999 the real estate portfolio delivered a total return of 11.7%, 30 basis points better than the total NCREIF return of 11.4%, and around 320 basis points over the funds’ internal target return for real estate (of around 8.5%).

**Comments:** The mainstream institutional asset classes of stocks, bonds, real estate and cash are (in addition to competing against one another), also competing against the increased portfolio weightings given to other areas such as private equity and hedge funds. For example, CALPERS (the largest pension fund in the US and the second
largest in the world after ABP) recently announced its intention to allocate $20bn to private equity investments and $5bn to its hedge fund portfolio. Given the total size of the fund (at $158bn), these allocations will represent 12.6% and 3.2% weightings respectively. Considering that the entire US pension fund industry currently allocates only around 1.5% of its’ total funds to equity real estate investments (down from a recent high of 4.0% in 1990), it is apparent that real estate needs to maintain its relative attractiveness in order to still be considered a core holding going forward.

In theory, out of the four investor types discussed in the second section of this paper, it is perhaps the pension fund who should adopt the most rigorous adherence to MPT, given that real estate is merely one of a number of asset classes being held and benchmarked in the portfolio. However, in many respects this is not necessarily the case.

Mary Ellen Grant, who runs the real estate portfolio at STRSO, explains that real estate is “artificially constrained” by the asset allocators in most pension funds, as a ‘pure MPT’ adherence would result in target weightings toward real estate of between 30%-50%. This high weighting would be justified, in MPT terms, by real estate’s high Sharpe Ratios, its low correlation and the size of the investable universe. Indeed, during the late 80’s, Grant states that STRSO were attempting to get their real estate weighting up
to 20%.\(^{21}\) (Clearly, in hindsight and in respect of return performance it was fortunate that these targets were never achieved).

Furthermore, to add to the “artificial constraints” that Grant refers to, despite the stated ‘Long Term Policy Objective’ of real estate achieving returns of between 8%-9% (see table above), Grant says that real estate is nevertheless ‘unofficially’ expected to return between 9%-12%. Part of the reason for this mismatch is that the asset allocations and target returns are only reset once every 4 years, allowing for internal and informal biases to develop within this period.

On the subject of diversification, Grant is very clear; certain elements of the portfolio are held for diversification purposes; for example the REIT account, “which gives us indirect access to assets that we normally could not hold, such as super-regional shopping malls”. However, other elements of the portfolio are not held primarily for diversification, such as co-investment in the international Opportunity Funds, which are “attractive because of their total (high) returns, not because of their diversification benefits”.\(^{22}\)
CONCLUSION

In an 1984 article which compared real estate returns with those of other asset types, Roger Ibbotson stated that, "while stocks are priced primarily on market or beta risk, and bonds are priced primarily on interest rate and default risk, the real estate pricing mechanism includes residual risk and non-risk factors such as taxes, marketability costs and information costs...The CAPM and APT formulations assume...any mispricing will be instantly arbitraged away. Many markets, including real estate, small company stocks and human capital, do not even approximate these conditions".\textsuperscript{1} Assuming this statement is correct, then trying to apply MPT to real estate is no better than dressing it up in the intellectual clothing of another asset class, in the vain hope of keeping institutions thinking that they are 'comparing apples with apples'.

Of course, this is a little extreme. Many institutions who hold vast stock and bond portfolios do not necessarily believe in the hypothesis of perfectly efficient markets themselves. If they did, their equity portfolios would be 100% invested in index trackers. However, the point is that MPT evokes strong responses from participants in the capital markets, clearly influenced by their own perspectives and experiences. In general terms, one could split the views on MPT into three broad camps, namely; 'the suffering believers', 'the healthy skeptics' and 'the fundamentally opposed'.

\textsuperscript{1} Assuming this statement is correct, then trying to apply MPT to real estate is no better than dressing it up in the intellectual clothing of another asset class, in the vain hope of keeping institutions thinking that they are 'comparing apples with apples'.
Those individuals who both helped and witnessed the vast flow of capital that went into real estate from around the mid-70's onwards are naturally those most inclined to believe in the classic MPT approach. Indeed, it was only by introducing critical performance measures such as NCREIF that real estate was able to be ‘philosophically accepted’ by the institutions. Blake Eagle, one of the original founders of NCREIF and a leading proponent of real estate in mixed-asset portfolios, could perhaps be described as a ‘suffering believer’.

Blake states that “the application of Modern Portfolio Theory is risk management. Institutional investors are required to manage risk, and Modern Portfolio Theory is a risk management tool which I don’t think can ever be ignored. I don’t know that it can be taken to the nth detail that some people think it can, but trying to is a perfectly legitimate course to pursue”.

Those investors who have seen the strong theoretical arguments made for a large real estate weighting in institutional portfolios (say, 20%-40%), only to see the actual weighting drop into single digits, could perhaps be described as ‘the healthy skeptics’. Mary Ellen Grant, who runs the real estate portfolio at the $57bn Ohio Teachers
pension fund, stated that “it doesn’t matter what MPT says. There is only so much
tolerance for real estate (in institutional portfolios)”.³

Lastly, there are those investors who simply ‘don’t get’ MPT. They believe that it is
possible, through thorough analysis of the fundamentals, to purchase a limited number
of assets that are unjustifiably ‘cheap’, that is, they are trading for less than their
intrinsic value. The classic theory in this regard is considered to be ‘Security Analysis’,
written in 1934 by Benjamin Graham and David Dodd. This paper introduced the notion
of a ‘margin of safety’ when buying an asset.

Warren Buffett is perhaps the most vocal of the ‘fundamentally opposed’. He states,
“needless to say, our Graham and Dodd investors do not discuss beta, the capital asset
pricing model or covariance of returns. These are not subjects of any interest to them.
In fact, most of them would have trouble defining those terms”.⁴

There is however, one school of thought about which both the proponents and
opponents of MPT would agree. Peter Bernstein recently wrote, “I always recall an
advertisement in the Wall Street Journal...that pictured a group of men pondering a
chart on the wall. The quotation under the picture read...“it is always a difficult time to
invest”.⁵
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**Interviews**

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NOTES:

Introduction:


2 Zaknic I. et al, '100 of the World's Tallest Buildings', (Council on Tall Buildings, 1999) for an account of how Skidmore Owings & Merrill's design for Lever House changed the face of office design in America.

3 Markowitz H.M., 'Portfolio Selection', Journal of Finance, 7:77-91 (March 1952)


7 Zell S., 'Modern Sardine Management', Real Estate Issues, Spring/Summer 1986. As blunt as a Mack truck, Zell never pulls punches when writing about real estate. This article, written in 1986, correctly predicted the coming real estate crash and "one of the biggest losses of capital in our country's history".

8 source: NCREIF

9 Riddiough T., 'Real Estate Finance and Investment', lecture notes, MIT Center for Real Estate, Fall 2000

10 United States Banker magazine, 'The RTC Clean Up', September 1993

Section 1.0

1 source: Board of Governors of the Federal Reserve System, 'Federal Reserve Bulletin', monthly

2 source: NAREIT. Congress passed the necessary legislation to form REITs in 1960. See www.nareit.org

3 LaSalle Investment Management, 'Investment Strategy Annual', Chicago 2000

4 attempting to estimate the total dollar value of all real estate in the United States would be worthy of a thesis on its own. The most recent survey of the entire US real estate market that is widely considered to be both credible and comprehensive was published by the Urban Land Institute ('ULI') in 1997, entitled 'America's Real Estate; Natural Resource, National Legacy', (ULI, Washington D.C.) 1997.

The 'kitchen sink' figure in the ULI survey, which attempted to place a dollar value on the entire land mass of the nation, including everything from residential and commercial structures, to all Government ownerships, to all agricultural, commercial and forest land, to all infrastructure (eg: roads, bridges, power
plants, etc) resulted in a total figure of $20.7 trillion (1994 figures). This total figure included an estimated value of $10.7 trillion for all single family homes, as well as an estimated value $4.5 trillion for all Government ownerships. Deducting these last two components results in a residual figure of $5.5 trillion for all private, non-residential real estate. Lastly, the ULI survey estimated the value of all private, non-residential land $1.1 trillion, essentially leaving a figure of $4.4 trillion for all private, commercial real estate. Comparing the ULI figure of $4.4 trillion with the comparable Merrill Lynch figure of $3.5 trillion illustrates the subjective nature of the exercise.


7 source: www.nasdaq.com


9 Ibid.


11 Paine Webber, ‘REITs Take New York’

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4 Outstanding Investor Digest, interview with Warren Buffett, August 8 1996, p.29


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3 Brealey R.A. and Myers S.C., 'Principles of Corporate Finance'

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3 Myers S.C., 'The Search for the Optimal Capital Structure', paper forms part of MIT Center for Real Estate reader notes, Fall 2000

4 Lend Lease / Price Waterhouse Coopers, 'Emerging Trends in Real Estate 2001', October 2000. The Lend Lease/PWC annual report is considered one of the most definitive surveys on institutional real estate sentiment in the US. It has been published annually since 1979, and is the successor (due to mergers and take-overs) to the annual Equitable Real Estate / Coopers & Lybrand survey.

5 Paine Webber, 'REITs Take New York'

6 Soros G., 'Soros on Soros: Staying Ahead of the Curve'

5 Dr. Stephen Phyrr, University of Texas, 1972, address quoted in J. Thomas Montgomery, 'Real Estate Investment Risk'
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2 Viezer T.W., 'Building Real Estate Portfolios One Deal at a Time, With an Eye on Diversification', Real Estate Finance, Fall 1999, p. 44-54

3 Zell S., 'Modern Sardine Management'

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2 Downs A., 'What Have We Learned From The 1980's Experience?', Salomon Brothers, Real Estate Investment Research, July 1991. This article is widely considered to be one of the best descriptions of the confluence of events that led to the crash in the early 90's.

3 source: www.aboutsimon.com (Simon Property Group web site)

4 Paine Webber, 'REITs Take New York'

5 Merrill Lynch, REIT research note on Simon Property Group Inc., 'Stagnant Sales Limit FFO/Share Growth', May 10 2001

6 interview between author and Rick Sokolov, COO of Simon Property Group. Took place in July 2001 in Youngstown, Ohio

7 Paine Webber, 'REITs Take New York'
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Conclusion


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4 speech given by Warren Buffett to Columbia Business School, and reprinted as an article in Columbia’s ‘Hermes’ magazine, Fall 1984