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EPRA RESEARCH

European Public Real Estate Association

The use of listed real estate securities in asset management

A literature review and summary of current practical applications

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Authors

Alex Moss

Visiting Lecturer at Cass Business School with 30 year's experience in RE finance. In June 2012, he formed Consilia Capital.

Andrew Baum

Professor of Land Management at the Henley Business School, University of Reading and Honorary Professor of Real Estate Investment at the University of Cambridge.

Contact

Alex Moss
alex.moss@consiliacapital.com

Andrew Baum
ab@andrewbaum.com

Fraser Hughes, EPRA Research Director:
f.hughes@epra.com

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Summary

Investors have historically used listed real estate to achieve a number of outcomes, ranging from general exposure to the asset class to meeting specific returns characteristics such as inflation hedging and tax-efficient income generation. However, following the events of the last five years, in common with other asset classes there is currently a re-assessment of the risk and return profile of listed real estate.

The purpose of this study is twofold: (i) to conduct a review of academic literature and evidence on the use and performance of listed real estate, both as a separate asset class and in multi-asset portfolios, and (ii) to examine in detail how institutions are using listed real estate to achieve their investment objectives, and the role listed real estate is playing in the new fund structures they are creating to meet investor objectives.

A review of the literature suggests that in the short-term listed real estate displays similar risk and return characteristics to the stock market rather than the direct property market, with higher levels of observed volatility and high positive correlations to the stock market. However, an analysis of returns over longer time periods indicate that there is a common real estate factor that drives the returns of both the direct and listed markets and that pricing in the listed market leads direct market indices. Whether this can lead to arbitrage is much less clear, as direct market indices may lag the direct market.

In a multi-asset portfolio the inclusion of listed real estate can provide both return enhancement and risk reduction to the portfolio, although recent evidence suggests that the diversification benefits may be reduced during periods of financial distress, with the correlation and sensitivity to movements in the stock market increasing.

When including both direct and listed real estate in a multi-asset portfolio there is some evidence to suggest that the inclusion of both enhances the overall portfolio return and reduces (diversifies) portfolio risk.

With regard to practical applications, we find that listed real estate is being used to fulfil an increasing number of investment objectives, both as a separate asset class and in conjunction with other assets such as unlisted funds, direct property, and infrastructure/commodities.

The reason for this popularity with both asset allocators and retail investors lies in the specific and definable investment characteristics which listed real estate can provide; greater liquidity than direct real estate, the returns that are linked to it, an above-average and secure dividend stream, a form of protection against future inflation shocks, and a geared exposure to improving asset prices.

1. Introduction

We have divided this paper into seven sections. Following this introduction, **Section 2** presents a review of evidence collected in academic studies on the properties of listed real estate, specifically its relationship with direct real estate, and its contributions to risk and return in mixed asset portfolios. Sections 3-6 focus on the practical applications or uses of listed real estate in a portfolio context. **Section 3** is an overview of the most common type of listed investment vehicles, namely dedicated real estate securities funds. **Section 4** examines the different types of strategies available in this format. **Section 5** describes the potential uses and applications of listed real estate in an investment strategy, while **Section 6** describes the potential uses and applications of listed real estate combined with other real estate structures in an investment strategy. **Section 7** presents conclusions.

2. Literature review

The academic literature relevant to this topic has focused on the extent to which the performance of listed real estate reflects the performance characteristics of the underlying asset class (physical or direct property) or those of the equity market. It is important to understand the qualities inherent in the listed real estate sector in order to understand its potential role in a portfolio. In short, if REITs have the underlying return profile of real estate rather than the equity market, but offer the liquidity of equities, this has a hugely beneficial impact on risk/return characteristics and provides a strong argument for their inclusion in traditional multi-asset portfolios. How, then, does integrating real estate and (more specifically) listed real estate into a multi-asset portfolio affects the risk/return characteristics of a portfolio?

In this review we take as a starting point the consensus view pre-2007 and then examine the literature since 2008 to see if there have been significant developments. *Prima facie*, the period 2008-2009 saw the increasing convergence of correlations across asset classes which are starting to filter through now into research studies.

2.1 The relationship between listed and underlying real estate

2.1.1 The short-term relationship

When comparing returns contemporaneously, the risk-return characteristics of REITs appear to have more in common with the returns of the stock market than with direct real estate returns. For example, REITs have typically experienced significantly higher levels of volatility (as measured by standard deviation) than is exhibited by the returns of the direct market (Myer and Webb, 1993) and higher positive correlation with stock markets (Westerheide, 2006), and in particular small cap stocks (Liu and Mei, 1992) than with direct market appraisal-based indices (Lee *et al*, 2000).

Clayton and Mackinnon (2003) present evidence of the volatility in US REIT returns in the sample period between 1978 and 1998. Volatility was correlated primarily with US large cap stocks, although it must be noted that the authors found that the level of impact had diminished over the sample period, with volatility becoming increasingly driven by small cap, bond and real estate markets. The relative short-term relationship between listed and direct markets could also be partly explained in the differences between

valuation methods and trading practices adopted in the relative markets, with the appraisals used predominantly in direct market indices subject to a smoothing effect and high levels of autocorrelation (Geltner 1991, Brown and Matysiak 2000), compared to the more immediate pricing adjustments possible in daily traded secondary markets of the listed sector.

2.1.2 The long-term relationship

However, a strong body of evidence suggests that when listed and direct market returns are compared over longer periods listed real estate performance exhibits stronger links with the direct market than with stock markets. An early study by Gilberto (1990) illustrates that where returns for the listed sector and direct market were regressed against other financial assets to determine drivers of performance, it was found that the residuals of the relative regression analysis displayed high levels of correlation. This would suggest that there is a common real estate factor that is present in driving the returns of the listed and direct real estate sectors and, significantly, is not a factor in driving the returns on other financial assets.

There are significant volumes of literature exploring the long-term dynamics between the listed and direct real estate markets - these appear to confirm the existence of a common real estate factor driving returns. For instance, Oikarinen *et al* (2011) examined the long-run relationship between the US-based NAREIT and NCREIF indices during the period 1977-2008 and found evidence of co-integration between the two return series, whereas no co-integration effect was evident between the listed real estate and stock market returns. This confirms the findings of a study by Pagliari *et al* (2005) in which returns were adjusted for the impact of appraisal smoothing, leverage and differences in sector composition, and no notable difference was found between the return means and variance of the NCREIF and NAREIT indices between 1993 and 2001.

There is some evidence that there may be a difference in behaviour between different sized listed real estate securities and the direct market. Clayton and Mackinnon (2003) find some evidence that a real estate factor was more evident in smaller cap REIT returns than in the returns of larger cap REITs during the mid-1990s.

2.1.3 International studies

While a considerable amount of research has been based on the US market, owing largely to the availability of data and relatively long time series, studies on the European listed markets have yielded evidence of the close long-term relationship between direct and listed real estate markets. For instance, Wang (2001) found evidence of co-integration between the UK listed and direct real estate markets, and in a broader international study Younus et al (2012) presented similar evidence of a long-run relationship and of Grainger causality between the listed and direct market returns in the UK, Dutch, Australian and US markets and confirms the presence of price discovery in public markets and leads the direct real estate market.

Hoesli and Oikarinen (2012) account for sector exposure and leverage when comparing the returns of the listed and direct real estate markets in the US, UK and Australia, and found evidence of a long-term relationship (over three years or more) when employing the Johansen Trace test for co-integration in each market, except the US office sector and the Australian market. The authors present evidence that indicates that both listed and direct real estate markets display a similar response to market ‘shocks’ and that the

returns of the listed sector are neither driven by the stock nor direct real estate market, with the listed sector leading direct real estate.

Westerheide (2006) studied the co-integration of REITs with stock markets, bonds and inflation on an international basis and found that there was no long-run relationship between movements in the REIT market with both stock market and bond returns, whereas there was evidence that REITs act as a weak hedge against inflation over longer periods.

2.1.4 Relationships since 1990

The relationships between the markets appear to have been dynamic, with evidence to support the theory that the relationship between REITs and the underlying real estate market has become stronger since the early 1990s (Clayton and Mackinnon, 2001 and Lee and Chiang, 2010). The same trend was also evident in the study by Oikarinen et al (2011) in which it was found that returns on the US REIT market since 1990 have led the US direct market returns when appraisal or valuation-based indices are used as proxies for direct market returns.

Many academics have proposed that this occurred due to the substantial increase in interest from institutional investors in US REITs as investments during this time, with REITs subject to a greater level of analysis. and that this contributed to the creation of a more efficient market in which future market expectations of performance were better reflected in the pricing of listed securities. Lee (2010) supports this view, stating that the comparison of REITs against other asset classes must be viewed in the context of underlying structural changes to REITs (e.g. changes in REIT taxation and ownership rules) to enable a comprehensive understanding of the behaviour of REITs as an investment class.

2.1.5 Do REITs lead the direct market?

Given that direct market valuations are typically ‘sticky’ in contrast to listed real estate, pricing in an efficient market should be able to incorporate new information quicker into pricing. It would therefore be logical for the listed real estate market to provide leading indicators for pricing in the direct market.

Several studies have provided evidence of such a link between the two markets, with direct real estate performance found to lag that of the listed sector. Listed real estate can thus be incorporated in models to predict future direct market returns (Ling and Naranjo, 2012; Gyourko and Keim, 1992). Barkham and Geltner (1992) also found evidence of a lag between markets, with pricing information from the securitised markets in both the UK and US taking up to a year before being reflected in the direct markets. Interestingly, a study by Li *et al* (2009) presented evidence of a causality effect between the NAREIT and NCREIF indices, suggesting the presence of some form of information flow from the listed sector into the valuations in the direct real estate index.

However, Baum and Hartzell (2012) warn that this lead-lag relationship between public and private market indicators may not be capable of arbitrage gains. The public index, assessed in real time, is different from an appraisal-based private real estate index, which may itself lag sentiment and marginal trading prices in the private market.

If, as the literature presented in this section suggests, the returns of listed and direct real estate are similar over the long term, then an investor with a perpetual investment horizon may find that the public and private markets are substitutable in a portfolio of investments with no significant benefit to be gained from investing in direct over listed real estate. However, given the weaker short-term relationship, there appears to be a role for direct real estate holdings as well as REITs in a real estate strategy.

The next section will discuss (i) whether there is evidence of the listed sector enhancing returns in a multi-asset portfolio; (ii) whether there is evidence of the listed sector enhancing returns in a portfolio where the portfolio includes an allocation to direct real estate; and (iii) whether there is evidence that optimal allocations vary over time.

2.2 The risk and return benefits of adding listed real estate to a multi-asset portfolio

2.2.1 REITs in a multi-asset portfolio

The impact of an asset on portfolio risk and return can be to either reduce risk while delivering the same return or by increasing return at the same level of risk. Early studies into the impact of REITs on multi-asset portfolios suggested that there was no significant difference between the performances of a portfolio of common stocks without REITs compared to one that included REITs (Kuhle, 1987). However, there are an increasing number of studies that provide significant evidence that that the inclusion of REITs in a multi-asset portfolio can both reduce risk in higher risk/return portfolios and enhance returns in lower risk/return portfolios (Mueller *et al*, 1994, Lee and Stevenson, 2005). Glascock and Bond's (2006) study of European real estate securities found that despite listed securities exhibiting a high correlation with stock market performance the correlation with bond markets was higher, with listed real estate providing additional growth potential to the portfolio while reducing the overall level of risk.

Lee and Stevenson (2005) also found evidence that including REITs in a multi-asset portfolio consistently provided diversification benefits over different investment horizons and that efficient portfolios included substantial allocations to REITs, with optimal weights increasing over longer investment horizons. This finding would appear to complement research into the relationship between listed and direct markets, where longer time horizons show a closer relationship between the markets.

Evidence from the study by Bond and Glascock (2006) on European real estate securities suggests that REITs have historically acted as low beta investments with counter-cyclical properties. For instance, during the 1990s real estate securities lagged the stock market during the equity bull market and then out-performed the stock market post the dotcom crash of the early 2000s. Lee (2003) presented evidence that supports this trend, as REITs were found to act as a relatively good diversifier of risk during periods of financial distress. Simon and Ng (2009) found that in the US market REITs acted as better defensive asset against the decline in the stock market than holding investments non-US stock markets. However, there is evidence that the diversification benefits of listed real estate can be eroded in periods of extreme volatility with Chong et al (2009) and Niskanen and Falkenbach (2010) finding that the correlation between REITs and other financial assets increased during periods of extreme market volatility.

2.2.2 Time varying variance and co-variance in REITs

These studies would imply that optimal REIT allocations differ in different time periods, because variance and covariance with other asset classes display time varying characteristics. A study by Chandrashekaran (1999) found evidence that the variance and covariance of REITs against other assets declined after an increase in the NAREIT index, and increased after a decrease in the index. Liang and McIntosh (1998) also found that the correlation between REITs, stocks and bonds exhibited time-varying characteristics with periods of both negative and positive correlations evident over the sample period.

There is also evidence to suggest that during a bear market the sensitivity of returns on REITs to stock market movement increases, but declines during bull markets (Goldstein and Nelling, 1999). Knight *et al* (2005) found similar results in a study on UK and global REIT indices where common stocks and REITs exhibited strong levels of tail dependence, especially in periods of poor stock market returns. However, Alcock, Lizieri and Steiner (2011) found that, after taking into account both linear and higher-order dependence, tail dependence between the UK listed and direct real estate markets with other asset classes are not as pronounced as previous studies would suggest.

The authors also found that the significance of tail dependence increased with frequency of returns with daily returns exhibiting greater levels of significance than weekly and monthly returns. Therefore, a portfolio that includes daily priced listed real estate could be more vulnerable to an increase in co-movement between real estate and equities than direct real estate investments where pricing is less frequent. This indicates that managers who are required to revalue and/or rebalance funds on a more frequent basis need to be aware of tail dependency risks when constructing a portfolio.

In the US REIT market, some studies have highlighted the change in the behaviour of REITs compared to other financial assets since the early 1990s. For example, Glascock *et al* (2000) found that US REITs behaved like bond investments pre-1992 but more like common stocks after 1992. This delivered a reduction in the benefits of diversification from the inclusion of REITs in a multi-asset portfolio.

2.2.3 The impact of REITs in multi-asset portfolios when direct holdings are included

Studies have produced mixed results when listed real estate and direct real estate holdings have been included in the same portfolio.

Mackinnon and Zaman (2009) found that the weaker mean reversion characteristic exhibited by REITs compared to direct real estate means that REITs display a similar level of risk to equities, and that the more predictable nature of direct real estate meant that when both are included in the same portfolio REITs play little or no role in optimal portfolio allocations. Stevenson (2001) also found that when optimal direct real estate portfolios are used as the base for real estate allocations, the addition of REITs to the portfolio does not improve the performance significantly.

However, it should be noted that it is widely accepted that investors are unable to buy index returns that are used to construct optimal direct real estate allocations. Baum and Struempell (2005) suggest that an investor would need to hold 86 individual properties (at a conservative estimate) in order to reduce tracking error to 2% on an index of the direct London office market. Therefore, in practice the inclusion of REITs is

likely to contribute positively to a real estate and multi-asset portfolio as direct holdings are unlikely to be 'optimal' as defined by direct indices.

As also suggested in Kennedy and Baum, 2012, when a sub-optimal and poorly diversified direct real estate portfolio is used - as is typical in real portfolios - the inclusion of REITs may have a more positive impact on the performance of a portfolio. There is also evidence that the listed sector has been able to out-perform the direct market after adjusting returns for leverage, sector composition and management fees. Ling and Naranjo (2012) calculate that unlevered core REITs (adjusted for differences in leverage and property type) outperformed the direct market benchmark by 46 basis points over the Q2 1994 – Q4 2010 period.

Mueller and Mueller (2003) found similar results when including REITs in a multi-asset portfolio. Both REITs and direct real estate improved the efficient frontier, but with direct real estate having a greater impact in the lower risk/return portfolios, whereas REITs provided some return enhancement across all risk/return spectrums. These findings confirm an earlier study by Feldman (2003) in which the US market was analysed over the period 1987-2001. In this study, the maximum direct and listed allocations in an optimal portfolio were 30% and 15% respectively.

2.3 Summary

A review of the literature suggests that in the short term, listed real estate displays similar risk and return characteristics to the stock market rather than the direct market, with higher levels of observed volatility and high positive correlations to the stock market. However, an analysis of returns over longer time periods indicates that there is a common real estate factor that drives the returns of both the direct and listed markets and that pricing in the listed market leads the direct market

In a multi-asset portfolio the inclusion of listed real estate can provide both return enhancement and risk reduction to the portfolio, although recent evidence suggests that the diversification benefit may be reduced during periods of financial distress, with correlations and sensitivity to movements in the stock market increasing.

When including both direct and listed real estate in a multi-asset portfolio, there is some evidence to suggest that the inclusion of both enhances the overall portfolio return and reduces (diversifies) portfolio risk. However, this relies on investors having an indexed exposure to direct real estate, which is rarely if ever possible.

3. The universe of listed real estate securities funds

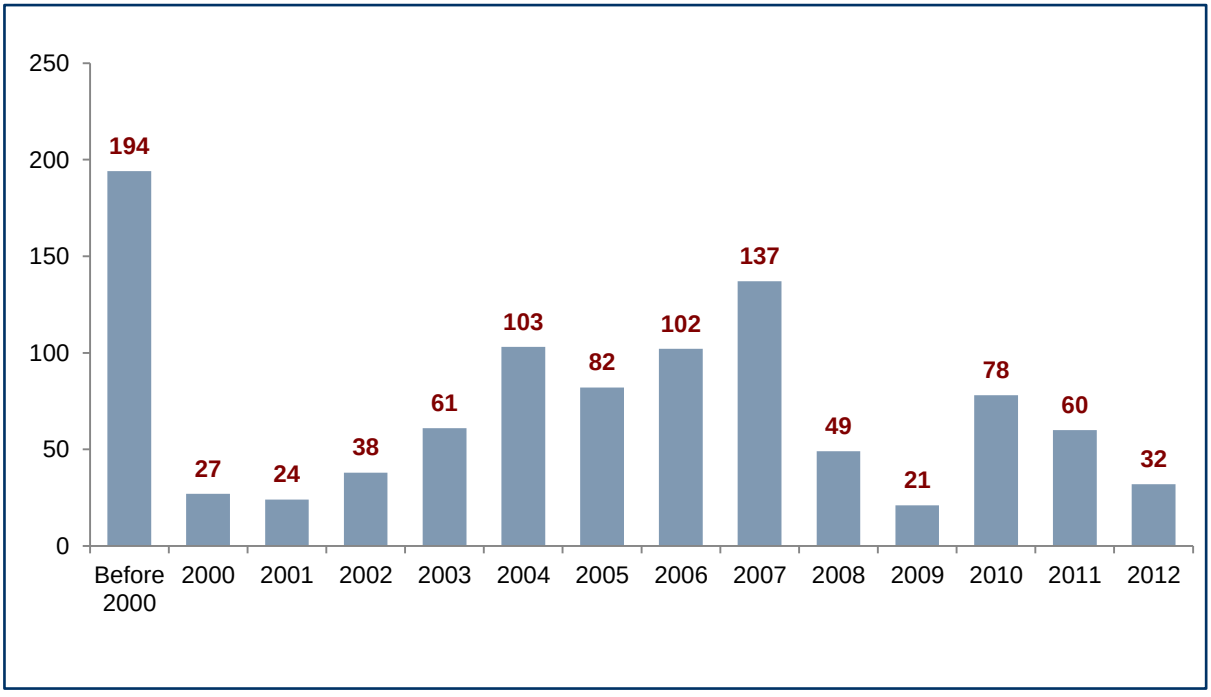
3.1 The growth of the market

Although listed real estate has been a feature of capital markets (at least in the US, Europe and Australia) since the 1960s, the first example of a dedicated global real estate securities funds that we are aware of is what is now known as the Alpine International Real Estate Fund, launched in 1989 by Sam Lieber. Given the growth in the US REIT market which started in the early 1990s, this proved to be a prescient move.

Starting in the late 1990s and most notably in the period 2000 to 2007, there was a dramatic growth of dedicated real estate securities funds (both regional and global) as well as unlisted funds.

This growth has continued since 2007, when the global financial crisis started to escalate. Assets under management of real estate securities funds grew 68% to USD 250 billion from 2007 to 2012, while the number of real estate securities funds increased 39% to 677 in the same period.

Figure 1: New real estate securities funds launched



Source: Consilia Capital

The roots of the growth in real estate funds (listed and unlisted) in the period 2000-2007 lay in the superior performance of the underlying real estate market during that period, which, fuelled by strong occupational demand and an increase in available debt capital, saw the asset class produce a comparable return to equities with lower volatility. This superior risk-adjusted return resulted in both retail and institutional investors seeking exposure to the underlying asset class. In addition the globalisation and securitisation that was occurring, led by the introduction of REIT legislation across the world, increased the geographic scope,

absolute size and liquidity of the investable universe. Product developers employed by asset managers were able to create collective investment vehicles that allowed this pool of capital to be harnessed in a variety of different ways.

Although there are clear differences between the structure of an unlisted fund (be it core, core plus, value-added or opportunity) and an index-benchmarked listed fund, the investment rationale is often similar. In summary, there was significant demand from both retail and institutional investors to gain access to the underlying asset class via a collective investment vehicle.

Although the number of new funds being launched has now slowed down, and there is increasing pressure on fund management margins in this area, it is interesting to note that after 2007 there have been some new entrants to the sector. At the larger end of the spectrum, for example, Blackrock have announced the creation of a global real estate securities platform and the formation of regional teams. In the UK, listed real estate funds and capabilities have recently been set up at asset managers with direct property experience, most notably Grosvenor Fund Management, Tristan Capital and Internos.

However, in common with other asset classes, institutional and retail investors are re-assessing appropriate asset class weightings post the global financial crisis. In particular, given the low level of risk-free asset rates globally, current low levels of inflation and the need to maintain flexibility in portfolio allocation there is a growing trend to focus on the underlying investment characteristics (such as certainty and level of income return and liquidity) of the asset/investment product rather than obtaining blanket exposure to an asset class. In addition, there is increasing interest in how combining different asset classes may produce required risk-adjusted returns.

3.2 The different mandates available

We can analyse the universe of listed real estate funds by geographical mandate using the Consilia Capital database. The table below shows the relative size, as measured by assets under management in US$bn, and frequency in terms of number of funds.

Figure 2: Real estate securities funds by mandate as at end December 2012

	AUM($bn)	Number of funds
Global Real Estate	61.2	251
US Real Estate	123.4	148
Asian Real Estate	14.2	112
European Real Estate	13.1	85
Global REIT	34.1	78

Source: Consilia Capital

As can be seen, the largest number of funds have global mandates, although by assets under management it is the US-mandated funds that dominate. This is due to two factors: (i) the use of US REIT mutual funds by private investors as a substitute for money market mutual funds following the downward trend in interest rates, and (ii) the dramatic growth in the US REIT market over the last four years due to a constant stream of secondary and primary equity issuance.

3.3 The influence of dedicated real estate securities funds

This sector is a significant element in terms of listed real estate. To put this into context, dedicated listed funds are responsible for around 25% by value of total holdings in the listed sector as represented by the EPRA Index, which currently has a market capitalisation of around USD 1,000 billion. The figure is likely to be significantly higher, as the Consilia Capital database only captures funds which submit returns to Bloomberg. There are two groups which will not feature in the database: funds that do not submit data, and (more importantly) listed separate account mandates rather than collective investment vehicles.

CBRE Global Investors and LaSalle Investment Management are good examples of asset managers which have significant separate account mandates but little representation in our funds database. It should be noted that real estate securities funds are normally structured to appeal to many different investor groups, and that each fund often has several classes of share for this reason, such as income/ accumulation, retail/institutional, different currencies, and hedged/unhedged.

3.4 Recent growth in global REIT funds for income investors

The key trend over the last 12-24 months has been the growth of assets under management by global REIT funds, driven in particular by Japanese retail investors, and the increased demand for income funds and real asset exposure. Figure 3. shows how global REIT mandates currently dominate the largest global listed real estate securities funds. We are aware that a number of these Global REIT funds aimed at Japanese investors adopt a series of income enhancement strategies, highlighting that the yield on the fund is a key driver in success in growing assets under management.

Figure 3: The largest global real estate securities funds as at end December 2012

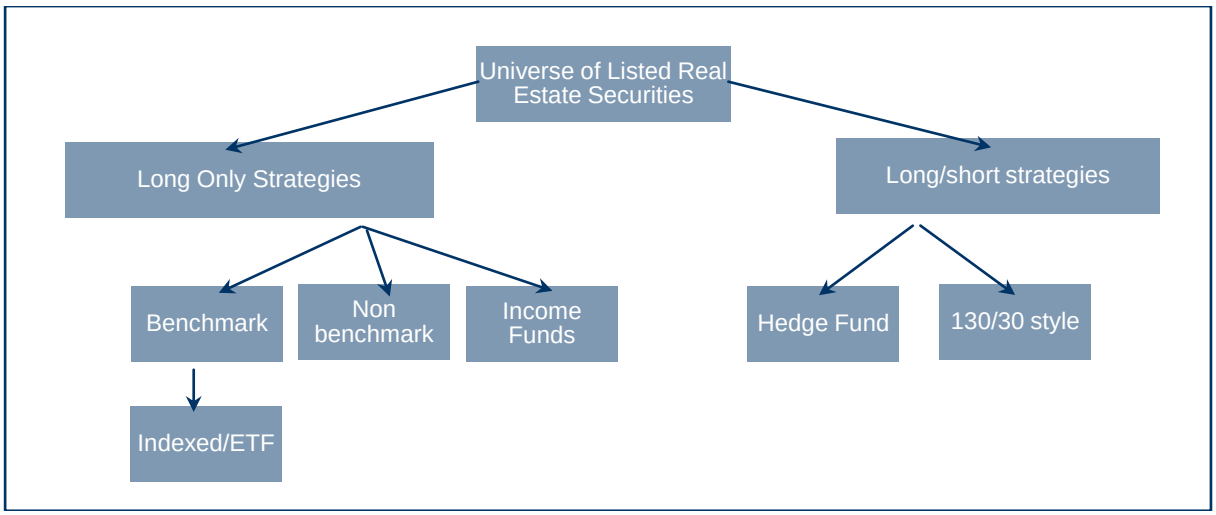
Fund	Mandate	AUMUS$bn
Nikko LaSalle Global REIT Fund - Monthly Dividend	Global REIT	6,563
ING Global Real Estate Fund/United States	Global Real Estate	4,712
Kokusai World REIT Open - Monthly Dividend	Global REIT	4,287
DIAM World REIT Index Fund - Monthly Dividend	Global REIT	2,869
Nomura Global REIT Premium Currency Select Monthly Dividend	Global REIT	2,475
iShares FTSE EPRA/NAREIT Developed Markets Property Yield Fund	Global Real Estate	2,252
Daiwa Global REIT Open Fund - Monthly Dividend	Global REIT	2,174
Morgan Stanley Institutional Fund Inc - Global Real Estate Portfolio	Global Real Estate	2,153
DLIBJ DIAM World REIT Income Open - Monthly Dividend - Sekaiyanushi	Global REIT	1,948
Sumitomo Mitsui Global REIT Open	Global REIT	1,890
Third Avenue Real Estate Value Fund/US	Global Real Estate	1,823
Prudential Global Real Estate Fund	Global Real Estate	1,574
DFA Global Real Estate Securities Portfolio	Global Real Estate	1,432
AMP Capital Global Property Securities Fund	Global Real Estate	1,429
Schroder Global Property Securities Fund	Global Real Estate	1,231
Principal Global Real Estate Securities Fund	Global Real Estate	1,226
Cohen & Steers REIT and Preferred Income Fund Inc	Global REIT	1,200
Invesco Global Real Estate Fund	Global Real Estate	1,192
Northern Multi-Manager - Global Real Estate Fund	Global Real Estate	1,121
Nomura Global REIT Open	Global REIT	1,112

Source: Consilia Capital

4. Listed real estate securities funds strategies

Having looked at the growth in the universe of listed funds and its constitution by geographical mandate, we now look at the different strategies that are on offer. The table below summarises the main groupings.

Figure 4: Overview of real estate securities funds strategies and styles



Source: Consilia Capital

4.1 Benchmarked funds

When seeking to determine the different strategies that funds operate, the easiest starting point is to see whether a benchmark is used. If so, investors have a clear indication of the desired risk/return profile and investment objectives of the fund. However, what is surprising is the number of benchmarks used. In Europe, for example, we have identified close to 90 funds with listed real estate at their core. Of these the majority use benchmarks. It might appear, therefore, that there is enormous duplication of strategies, and that many would share the same benchmark. We find that for the funds that used a benchmark EPRA is by far the most popular provider but there is less consistency than appears within this group. Figure 5. shows the different benchmarks used.

Figure 5: EPRA Benchmarks used by European funds December 2012

EPRA Indices used as Benchmarks by European RE Securities Funds
FTSE EPRA/NAREIT Euro Zone Capped Index
FTSE EPRA/NAREIT Euro Zone Index
FTSE EPRA/NAREIT Developed Europe Index
FTSE EPRA/NAREIT Developed Europe ex UK Index
EPRA Euro Zone Net Return index
EPRA Europe Net Return Index
EPRA NAREIT UK Net Total Return Index GBP
EPRA NAREIT Europe Liquid 40 Net Total Return Index EUR
EPRA NAREIT Europe Liquid 40 Ex UK Net Total Return Index
FTSE EPRA NAREIT Europe Net Total Return Index USD
EPRA Europe Total Return Index GBP
FTSE EPRA/NAREIT Developed Europe Ex UK Dividend+ Net of Tax TR EUR

Source: Consilia Capital

The differences in benchmarks can be broadly allocated to the following factors:

i. Geography: Europe, Eurozone, Europe ex-UK
ii. Currency: USD, EUR or GBP
iii. Size: the full universe or (for example) the top 40 stocks
iv. Return: price or total return

As was the case with the European sample, we found that there was a wide range of benchmarks stated for global real estate funds, with the FTSE/EPRA/NAREIT Developed Index (in its various forms) by far the most commonly used.

4.2 The use of non-free float indices

In addition to the industry standard FTSE/EPRA/NAREIT Developed Index, other indices are increasingly used as global funds seek to differentiate themselves. These include:

i. Liquid indices – for example, the Cohen & Steers Global Realty Majors Index, which focuses only on the largest, most liquid stocks
ii. Emerging market indices – for example, the FTSE/EPRA/NAREIT Emerging Index which can be used independently and is also fully integrated into the FTSE/EPRA/NAREIT global series
iii. REIT Indices - reflecting the typically higher income component of REIT-only structures
iv. Fundamental (as opposed to free float market capitalisation) indices

Fundamental indices are created using economic values for weightings rather than the traditional market capitalisation, less an adjustment for insider holdings. The theory behind their use is that these accounting or valuation measures provide a more accurate indication of the intrinsic value of the company and the company's economic power compared to the daily fluctuating price on the stock market. In the case of the GPR Global Property Fundamental Index, the specific factors used are rental income, EBITDA and gross dividends. While these may represent a more fundamental guide to value, fundamental factor weightings

can cause problems for investors if a company with a relatively low free float has a high weighting in a fundamental index. For real estate, fundamental indices could represent an important link between the highly volatile daily pricing methodology of equity indices and the unleveraged smoothed returns of a direct property index.

As yet, there are no specialist indices (for example, a global offices index) in use as benchmarks, although these are used as market indices and EPRA does provide them. This is a reflection partly of the lack of sector specialisation outside the US, and partly the premium currently paid for size or liquidity against specialisation.

In addition to benchmarked funds there is also a category of non-benchmark constrained funds. These funds seek to deliver returns related to the underlying real estate of their holdings, but are not concerned with tracking error relative to a benchmark.

4.3 Non-benchmarked funds

Non-benchmark constrained funds seek to provide what is typically described as 'a mixture of income and capital growth'.

Case study 1: the M&G Global Real Estate Securities Fund

A good example of a non-benchmark constrained fund would be the *M&G Global Real Estate Securities Fund,* set up in 2008. As a result of the absence of a benchmark, the fund weightings can be quite different from those in a benchmarked fund. Figure 7. illustrates the portfolio holdings of the M&G Fund as at end October 2012 compared to a leading benchmark fund, in this case the *ING Global Real Estate Fund* which is benchmarked against the S&P Developed Property Index. As can be seen there are notable differences in exposure to, for example the US, Japan and Canada, as well as niche companies like Shaftesbury, which reflect, *inter alia*, the different size of the fund (the ING fund has assets of USD 4,500 million, while the M&G Fund is approx. USD 100 million) as well as the choice of benchmark. (Both funds have four-star ratings from *Morningstar*.)

Figure 6: Portfolio allocations, benchmarked and non-benchmarked funds

Top 10 holdings %			
	ING Fund		M&G Fund
Simon Property	4.7	Simon Property	6.2
Mitsubishi Estate	4.0	Westfield Group	4.1
Mitsui Fudosan	3.3	Link REIT	4.1
Westfield Group	3.1	Unibail-Rodamco	2.7
Boston Properties	2.8	Avalonbay Communi	2.7
Unibail - Rodamco	2.7	CBL & Associates	2.6
Cheung Kong	2.4	Summarecon Agung	2.5
Host Hotels	2.3	Shaftesbury	2.5
Macerich	2.2	Boardwalk	2.4
Westfield Retail Trust	2.0	Land Securities	2.4

Top Country Weightings %			
	ING Fund		M&G Fund
United States	43.6	United States	36.6
Japan	14.2	Hong Kong	11.1
Hong Kong	12.3	Canada	8.6
Australia	10.1	Australia	8.0
United Kingdom	5.3	UK	7.0
France	5.1	Japan	6.3
Singapore	5.1	France	2.7
Canada	1.7	Indonesia	2.5

Source: Fund fact sheets

The fund prospectus states the following.

The M&G Global Real Estate Securities Fund invests in real estate investment trusts (REITs) as well as other types of property companies to optimise long-term total return. A high-conviction investment process is utilised to select stocks, with a focus on structural shifts in global property markets through listed, rather than direct, property vehicles. While remaining risk-aware, there is a pragmatic approach to stock selection. Attractively priced stocks are screened on an absolute basis, rather than on relative value, in the belief that real estate prices are driven by the net asset value of a company.

4.4 Income funds

While both benchmarked and non-benchmarked funds seek to provide a mixture of income and capital growth, the decline in risk-free rates globally has led to a rise in demand for income-focused listed real estate products. There are two specific strategies that seek to deliver this: first, using a portfolio of higher-yielding REITs; second, through writing call options on the underlying portfolio and taking the premium received, distributing it as a dividend to unit holders.

Good examples of the former strategy are the *CBRE Clarion Global Real Estate Income Fund*, the *Cohen & Steers Realty Income Fund*, and (on a regional basis) the *B&I Pan-Asian Total Return Real Estate Securities Fund*. A good example of the second strategy, in addition to the funds managed for Japanese retail investors, is the Schroder Global Property Income Maximiser Fund.

The key issue to remember with these enhanced income funds is that investors are accepting a cap on future performance above a certain level (by writing a call option) and taking that as income. It is therefore suited to certain stages of the cycle when capital growth is limited and income is required.

4.5 Indexed funds and exchange-traded funds

One of the most noticeable trends across all capital markets has been the increased use of Exchange Traded Funds (ETFs), and the real estate securities sector has seen a number introduced over the last five years in particular. The most recent figures show that total assets under management for ETFs pegged to FTSE EPRA/NAREIT real estate indices jumped 85% to USD 8.7 billion in the 12 months through to February this year.

These funds seek to track an index at low cost, albeit with various levels of tracking error. As can be seen the US is the most popular market for these products, followed by global mandates. We are also aware of a number of ETFs which follow various 'International' indices (for example, global excluding the domestic country or region).

Figure 7: ETFs by mandate and AUM as at end December 2012

Mandate	AUM (US$bn	Number
Asian Real Estate	1.5	17
Canadian Real Estate	1.3	1
European Real Estate	2.3	10
Global Real Estate	7.5	10
Global REIT	1.7	3
US Real Estate	30.9	30

Source: Consilia Capital

4.6 Long-short strategies

All of the above funds types run long-only strategies. In other words, if the fund manager has a bearish view of the market the most defensive action he can take is to increase the level of cash to the maximum allowed under the fund's prospectus (normally 10%). During the mid-2000s, a new type of fund emerged, which allowed long-only managers to have limited short positions. These were known as 130/30 funds. In essence they allowed a fund manager to run a maximum 130% long exposure which would be offset by a maximum 30% short position.

If, for example, a fund had assets of GBP 100 million and the manager was positive on the UK but negative on Europe, then instead of a GBP 100 million UK exposure they would be allowed GBP 130 million, enhancing returns assuming the position proved to be profitable, offset by a short position of GBP 30 million on European stocks, leaving a net GBP 100 million exposure. Several fund managers launched such funds.

They did not prove overwhelmingly popular initially but are now becoming more common as a structure and strategy.

Specialist real estate securities teams incorporate these long/short strategies alongside traditional long-only structures. The team at Thames River run a hedge fund (the Longstone Fund), a UCITs 3-compliant style Long/Short equity fund, and are currently launching their *F&C Real Estate Equity Long/Short Fund* which aims to generate a return of 8-10% by investing in a portfolio of pan-European real estate securities.

Cohen & Steers also run a *Global Real Estate Long/Short Fund*, and it is worth examining their investment philosophy.

"Long positions focus on property companies trading at a discount to their net asset values, with strong balance sheets, proven management teams and solid business models. Short positions are used as opportunistic investments based on specific catalysts, or as hedging instruments designed to mitigate risks related to the broad equity market, foreign exchange rates, interest rates and various country- and company-specific factors."

In 2006 a number of specialist real estate securities hedge funds emerged. These were in sharp contrast to the long only benchmark-based fund strategies, and had few constraints in their mandates, but as a group they did not survive the liquidity crisis of 2007-2009.

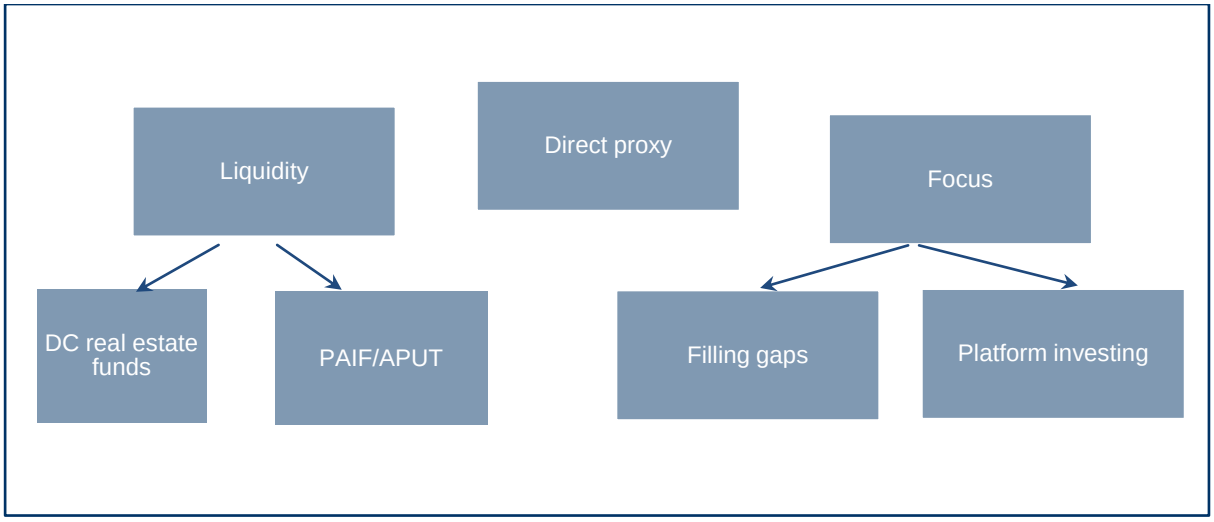
Finally, it is worth mentioning the involvement of generalist hedge funds, such as Moore Capital, in the sector. Broadly speaking, hedge fund interest in the sector will depend upon their broad strategy types, such as Long/Short, Event Driven, Tactical Trading and Relative Value. There will always be some interest in the sector dependent upon corporate activity, liquidity and relative valuation but their significant involvement tends to occur infrequently, at times of maximum liquidity, stress and pricing "dislocation" (i.e. large discounts to a realistic NAV), such as 1Q 2009 when listed companies were having their rescue rights issues at deeply discounted prices.

5. The applications of listed real estate in an investment strategy

5.1 The applications

Figure 5. shows the main applications of listed real estate in asset allocation. It can be used as a proxy for direct or private real estate (section 5.2); it can be used to add liquidity to a private real estate fund or portfolio (for defined contribution funds, unit-linked funds or PAIFs, for example) or it can be used when the best available asset manager happens to be a listed fund or company (section 5.3). This means that sometimes listed real estate will be used on its own, and sometimes it will be combined with other real estate formats (section 6).

Figure 5: applications of listed real estate



5.2 Using listed real estate as a proxy for direct real estate

The China National Council for Social Security Funds recently awarded a listed real estate mandate to AMP. The objective appears to be to use listed real estate to deliver a real estate exposure as part of the multi-asset portfolio (see case study 2).

In the US this strategy has been extremely popular with US state pension funds, which have awarded domestic and global REIT mandates to fulfil their requirement for a real estate exposure. In Europe PGGM and APG have both (at times) been keen proponents of using the listed sector as a way of delivering direct real estate returns.

Case study 2: The National Council for Social Security Fund of China

China's National Council for Social Security Fund (NCSSF) is a EUR 111 billion sovereign fund. Although the Fund was established in 2001, the NCSSF was prohibited from investing overseas until 2006. Having appointed its first global equities, fixed income and regional mandates, it is now targeting global REITs as a

liquid, tax-efficient proxy for the global real estate market. Anthony Faso, international business director at AMP Capital, said:

"The NCSSF has reached out to managers to develop its expertise in global investment. They want to learn about pensions and to evolve towards the international market."

The mandate will seek to outperform the EPRA benchmark, with 32% allocated to Asia, 14% to Europe and the balance to North American markets.

Case study 3: BPF Bouw

Dutch pension fund BPF Bow has increased its allocation to listed real estate as part of a plan to invest in both public and private real estate in a fully integrated way, and will be able to invest as much as 8% of its real estate capital in listed investments as part of a portfolio managed by a single, integrated team at asset manager Bouwinvest Real Estate Investment Management.

The fully integrated listed strategy will enable Bouwinvest to take advantage of market cycles and arbitrage opportunities with the non-listed sector. Another main objective is to 'fill in holes' where Bouwinvest is unable to find the right non-listed product, whether this is a real estate fund, club deal or joint venture. A recent example of the execution of this strategy was an investment in five real estate investment trusts (REITs) to gain exposure to regional malls in the US, given that many of the best assets in the sector are held by listed REITs.

5.3 Using listed real estate for platform investing

The concept of platform investing (allocating money to specialist asset managers, or sub-contracting) is well known to real estate private equity managers, but it is increasingly being used in the listed sector. There are two specific reasons for this: firstly, a belief that specialist management teams and niche sectors deliver superior returns over the long term; secondly, the current limited equity funding available for smaller listed companies and unlisted funds means that platform investors can fill the gap, providing a critical lifeline of support and expansion in the same way that mezzanine debt funds are filling the gap left by the reduction in senior debt.

Case study 4: Forum Partners

In the current market, where there is often a focus on liquidity, companies such as *Forum Partners* help to provide restructuring capital and market expertise to small and mid-size real estate companies that are traditionally underserved by the capital markets. In return for providing equity or mezzanine finance, equating to say 10-25% of the company's capital structure, they take a seat on the board and help the company to expand. They have successfully executed this strategy globally, with over 70 investments in 17 countries in Europe and Asia. Examples of their investments in Europe are New River Retail in the UK and Zueblin in Switzerland.

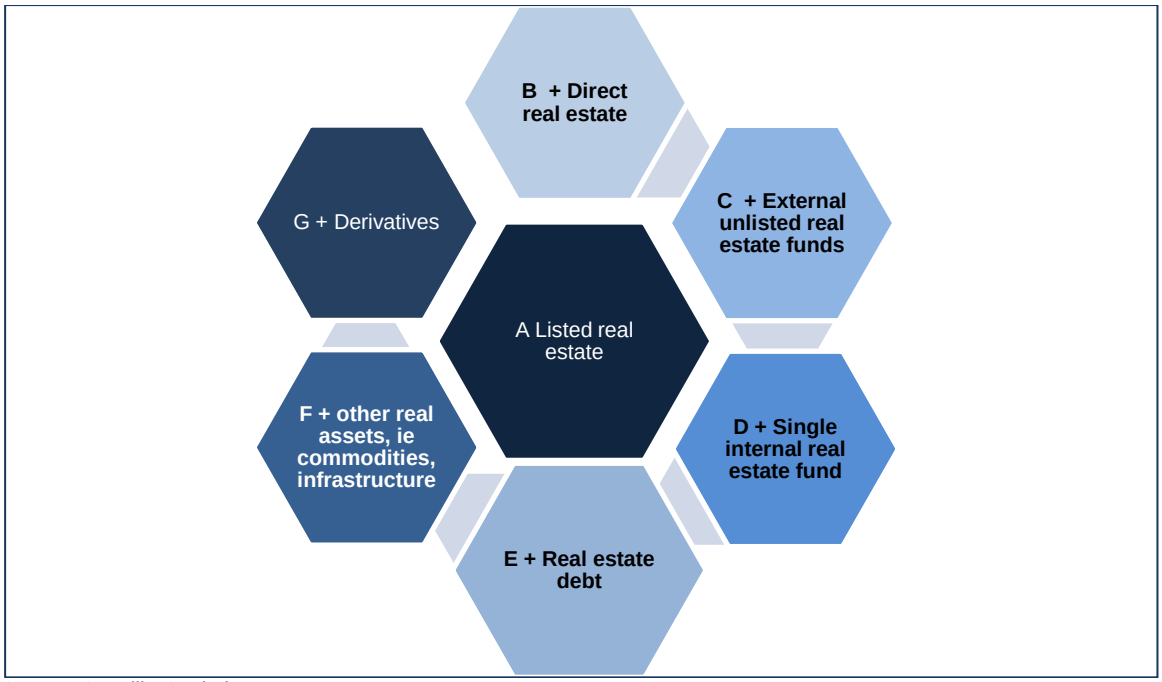
6. Mixing listed real estate with other real estate assets

6.1 Possible combinations

Against a background of new risk/return requirements the liquid, listed real estate sector is increasingly used in portfolio construction with other real estate-related assets. In this section we examine the potential range of combinations available to portfolio managers and product developers, using listed real estate as all or part of the real estate portfolio. We can think of this as a palette of available real estate options with subtly different risk and return characteristics compared to a benchmarked listed real estate exposure. Having identified the available options, we look at each in turn to see what investment products are currently available, how they differ, and which areas are likely to increase as a result of regulatory or market factors.

The chart below illustrates the palette of available options, with listed real estate at the core, forming part of all the strategies. We examine all the possible strategies, starting with combining listed real estate with direct real estate, and continue round the palette clockwise.

Figure 8: Palette of potential combinations of listed real estate with other quadrants



Source: Consilia Capital

6.2 Listed real estate plus direct real estate

Case study 5: TR Property

The most well-known example of combining listed and direct property in a fund format is the *TR Property Investment Trust.*

The manager currently applies the following guidelines for asset allocation:

UK listed equities 25 – 50%
Other listed equities 0 – 5%
European listed equities 45 – 75%
Listed bonds 0 – 5%
Direct UK property 5 – 20%

As at October 2012, the actual holdings were:

UK direct property 10%
UK quoted shares 38%
Continental European shares 52%

The investment guidelines are as follows:

"To deliver a spread of investment risk, the maximum holding in the stock of any one issuer or of a single asset is limited to 20% of the portfolio. In addition, any holdings in excess of 5% of the portfolio must not in aggregate exceed 50% of the portfolio. These limits are set at the point of acquisition. However, if they were materially exceeded for a significant length of time through market movements, the manager would seek to remedy the position."

It is important to note that as the TR Property Investment trust is close ended, it is able to add debt to the balance sheet to part finance the direct property holdings. The Fund's policy on gearing is as follows:

“The fund may utilise gearing with the purpose of enhancing shareholder returns. The maximum permitted indebtedness currently permitted under the Company’s bank facilities is 25% of the portfolio value. Accordingly, the current guideline is 10% Net Cash to 25% Net Debt (as a percentage of portfolio value). The Trust invests in the shares of property companies which themselves employ leverage. The total level of gearing the Trust is exposed to through the balance sheets of investee companies, together with the borrowings of the Trust itself, is referred to as the 'see-through' gearing.”

As with listed real estate companies, the gearing will enhance performance when the underlying returns are positive, but increase the downside when they are negative.

In addition to the TR Property Investment Trust, the same manager also runs a smaller, open-ended vehicle, which combines direct property and listed real estate, and has a greater emphasis on income, called the Thames River Property Growth and Income Fund. It should be noted that this structure does not use debt.

When funds manage both listed and direct real estate it is common to have a combined benchmark which is split between direct property (typically IPD benchmarks are used) and listed.

6.3 Listed real estate fund plus external unlisted funds

Case study 6: HORECA

In 2012, pension fund HORECA awarded a mandate to Northern Trust for the passive management of a EUR 200 million listed real estate portfolio. The HORECA pension scheme's 10% allocation to real estate is equally divided between listed and non-listed, using a passive strategy to replicate a mixed benchmark.

Case study 7: The HSBC Open Global Property Fund

A good example of a structure combining listed funds with unlisted funds is the *HSBC Open Global Property Fund* run by Guy Morrell. This fund combines a geographic allocation strategy with the ability to invest in funds that are exposed to both listed and unlisted property markets. Figure 9. shows the allocation of this fund as at October 2012.

Figure 9: HSBC Open Property Fund allocations

HSBC Open Global Property Fund Allocations October 2012

Asset Allocation	%	Geographic Allocation	%
Property Securities Funds	61	UK	42
Direct Property Funds	37	North America	27
Cash	2	Asia Pacific	26
		Continental europe	5

Top 5 Holdings	%		%
HSBC MultiAlpha Global real Estate Equity	11	Schroder Global Property Securities	10
Schroder Asia Pacific Property Securities	11	Henderson UK Property Class	9
		M&G Property Portfolio	9

Source: HSBC

6.4 Internal Listed real estate fund plus internal unlisted funds

The decline of defined benefit pension schemes and the growth of defined contribution plans, which require daily fund pricing, have led to innovation in the market. This requirement for liquidity has meant that a mix of listed and unlisted real estate is an increasingly popular approach. Some managers now combine two internally managed funds, one of listed assets, and one of unlisted funds, for this purpose.

Case Study 8: The Legal and General Hybrid Property Fund

Legal & General Property (LGP) together with Legal & General Investment Management (LGIM) launched a new product in 2011, the Hybrid Property Fund. They claim this offers defined contribution (DC) pension schemes a new and innovative way to invest in property funds while managing volatility and liquidity. Developed in conjunction with an investment consultant, the fund invests in LGP's UK balanced fund (the Managed Property Fund) and LGIM's Global REITs Index Tracker Fund on a default position split of 70:30. As at May 2011, the fund was available to a number of other DC schemes and has been selected by a major life platform to provide its clients with global real estate exposure.

Providing a property allocation that has been specifically designed in conjunction with investment consultants to meet the optimum criteria of UK DC pension schemes, L&G say the fund caters to the increasing long-term growth trend of DC. The combination of UK direct and global indirect funds provides greater diversification and liquidity, while reducing fund expenses and the entry and exit costs typically associated with direct property investment. In order to provide the ability to adapt to market movements, the manager has the flexibility to alter the 70:30 default position of the fund within pre-set benchmark ranges.

6.5 Listed real estate fund plus real estate debt

There is an increased appetite for listed real estate debt and credit to meet investor objectives of income, security and liquidity.

As yet this area has yet to be fully explored, but a number of consultants are espousing the use of commercial real estate debt. Insurance companies are providing long-term debt once again as a result of more beneficial Solvency II regulations for debt than direct investment, and numerous asset managers are setting up debt funds. It appears to be only a matter of time before the two are combined to provide a 'blended' real estate exposure, although what the investment characteristics of such a hybrid may be are hard to define.

6.6 Listed real estate plus other 'real assets'

The growth in commodities and resources as an asset class, coupled with a need to provide protection against inflation, has led to increasing attention on 'real asset' funds.

Case study 9: The Cohen & Steers Real Assets Fund

Cohen & Steers holds the view that massive global stimulus and sustained growth in emerging markets will ultimately drive inflation higher. They believe real assets can offer attractive investment characteristics from a fundamental perspective, along with inflation-fighting tendencies that help maintain a portfolio's long-term purchasing power.

The structure of this fund, which we believe may be replicated by others, is as follows. It invests primarily in core real asset categories, consisting of global real estate securities (25-35%), commodities (25-35%) and global natural resource equities (15-25%). It may invest up to 20% of the portfolio in diversifiers for added stability, including gold and fixed income in multiple currencies. It utilises a multi-manager approach for core real asset categories.

6.7 Listed real estate plus derivatives

Combining listed real estate and derivatives is the key strategy employed by the Iceberg funds managed by CBRE Reech AiM. The fund invests across the full spectrum of investment vehicles, but focuses on listed real estate and derivatives with a highly quantitative investment process.

Although this fund does not use listed real estate as such, we should mention the inProp UK Commercial Property Fund managed by inProp Capital, which is a synthetic ungeared long-only UK commercial property

market tracking fund which aims to deliver property market beta returns in an open-ended structure with monthly liquidity. We might expect to see the future use of listed real estate with this type of structure. The fund launched with approx. GBP 40 million in 2010 and currently has assets under management of approx. GBP 150 million. It aims to pay a quarterly dividend in line with property market rental incomes and to display a volatility of returns similar to those seen in transaction-based property indices.

6.8 Listed real estate fund providing liquidity in a direct property fund

In the UK, Property Authorised Investment Funds (PAIFs) are new tax-efficient collective vehicles for the retail and institutional market. They follow (and may replace) the Authorised Property Unit Trust, which is a direct property fund required to hold 15% of its assets in a liquid form. The increasing popularity of these vehicles is likely to lead to an increase in the use of listed real estate in direct property funds.

7. Conclusions

The literature review we summarise in Section 2 shows a very limited focus by academics on the role of listed real estate. With a very small number of exceptions, the literature reveals an implicit assumption that listed real estate can play a significant role as a separate asset class in portfolio construction, typically as an alternative to direct real estate. The focus on co-integration and lead-lag relationships follows from the hypothesis that listed is the same asset as direct or unlisted, or may be superior to it.

The real world is somewhat different. We find that there is a wide range of applications of listed real estate, both directly and through funds. It can be, and is, used as a proxy for the direct or private market. Because of the increased premium placed on liquidity by both regulators and investors and the more efficient pricing mechanisms available, listed real estate is used to provide exposure to real estate with daily pricing and liquidity for increasingly important defined contribution platforms. Because of globalisation, listed assets are used to filling gaps in global real estate funds. Sometimes, listed managers are used by unlisted funds for their specialism or expertise.

Listed and unlisted funds are combined to explore arbitrage opportunities. Listed real estate and derivatives are combined in a search for attractive absolute returns. Debt products will be added, and other arbitrage opportunities will emerge. This is a quickly developing field, and more pragmatic research (for example, to examine whether these propositions deliver what they promise) should be encouraged, alongside a continuing, and worthy, academic tradition.

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About the authors

Alex Moss

Alex gained an MA in the Economics of Finance and Investment from Exeter University in 1981, and has spent 30 years specialising in the property sector, encompassing sell side research, corporate broking, and private equity. He has written articles for numerous professional publications, and is a regular speaker at conferences globally. He is a Visiting Lecturer at Cass Business School, and has lectured on global property securities markets at Cambridge University, London Business School, and Oxford Said Business School. In June 2012 he formed Consilia Capital.

alex.moss@consiliacapital.com

Andrew Baum

Andrew Baum is Professor of Land Management at the Henley Business School, University of Reading and Honorary Professor of Real Estate Investment at the University of Cambridge. He teaches real estate MBA classes at several institutions and is also active in the real estate industry as a consultant and non-executive.

ab@andrewbaum.com