

Listed Property Performance as a Predictor of Direct Real Estate Performance

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March 2009

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Executive Summary

Over the firm's 23 years of investing in real estate securities, Cohen & Steers has observed that listed property securities market performance tends to lead that of direct property markets.¹ This paper seeks both to establish empirically the extent to which REITs lead direct real estate and to understand the reasons why such a relationship may exist. We conclude that the listed real estate market provides valuable information about the direct property market cycle, a fact that can have meaningful implications for real estate investors.

We found that the listed market generally leads the direct market by about six months, as REIT liquidity allows for greater pricing transparency and quicker information transfer than less-liquid direct markets. We also found that while listed returns provide leadership directionally, they tend to overshoot the measured eventual direct market moves (whether this is because direct return series understate the true moves in value remains up for debate). The time of the "lag" and the magnitude of the over-/understatement of returns vary by market, and depend on the quality of the direct market valuations and the composition, balance sheets and activity of the listed real estate companies.

We also examine the practical implications these findings may have for asset allocation decisions, and discuss how this relationship may point to attractive buying and selling points in the cycle for direct investors, and possibly to arbitrage opportunities between listed and direct property markets as well. The major limitations to such practical implications include the time and transaction costs needed to make direct real estate investments, and the ability to determine a true "turning point" in listed returns.

The paper provides more detail on our findings and is divided into the following sections:

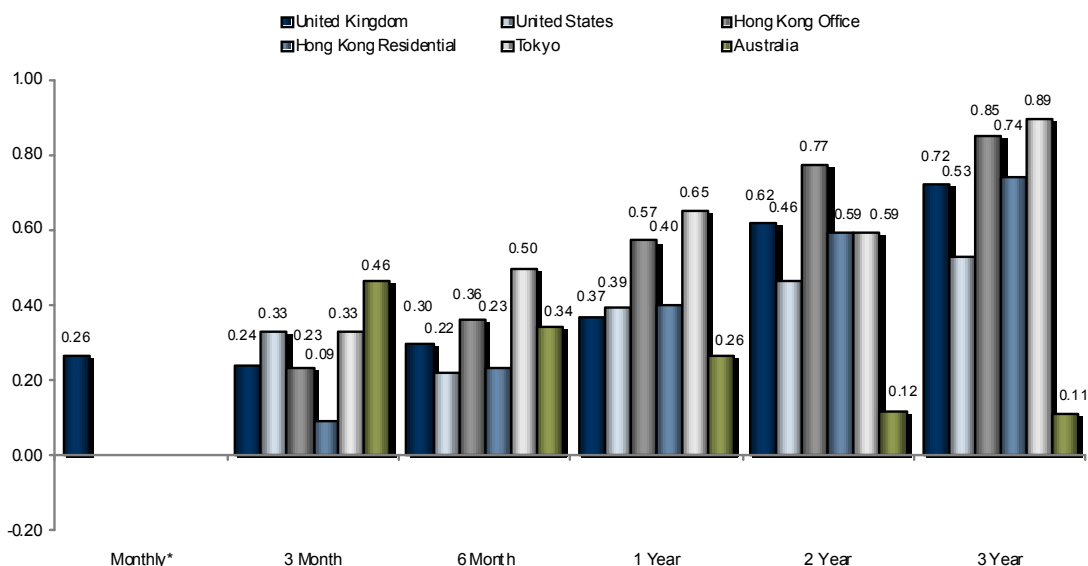
- 1) Listed Property Performance Leads Direct Real Estate Performance
- 2) Why Listed Property Leads Direct Markets
- 3) Implications for Asset Allocation Decisions
- 4) Limitations to Methodology
- 5) Conclusion
- 6) Appendix

¹ Listed property securities include real estate investment trusts (REITs), listed property trusts (LPTs) and other real estate securities. Direct property includes direct real estate investments, unlisted closed-end funds and unlisted open-end funds.

1) Listed Property Performance Leads Direct Real Estate Performance

Correlations between listed and direct real estate returns vary significantly, depending on the holding period. Over shorter periods, real estate securities more closely track equities. Over longer periods, however, real estate securities' performance falls more in line with that of direct real estate, as shown in Exhibit 1. (With Australia a significant exception, please see page 7 for a discussion on this market.)

Exhibit 1: Correlations Between Listed Property and Direct Real Estate Across Holding Periods, 1998–2008



Source: Bloomberg, Investment Property Databank (IPD), MIT, FTSE NAREIT, JLL and Japan Commercial Land. As there is no index for the Hong Kong office, Hong Residential and Tokyo office public real estate securities markets, we created indexes using the weighted average returns of the following securities for each market: Hong Kong Office—Hysan Development Monthly, Great Eagle Holdings and Hongkong Land Holdings; Hong Kong Residential—New World Development, Sun Hung Kai Properties, Cheung Kong Holdings and Henderson Land Development; and Tokyo Office—Mitsui Fudosan, Mitsubishi Estate, Sumitomo Realty Holdings and NTT Urban. The Tokyo Direct Office market is represented with data from Japan Commercial Land Prices from 1991 through 2000, by JLL for 2000 through 2007 and Japan Commercial Land Prices after 2007.

* The property return data for the U.S., Australian, Hong Kong and Tokyo markets is based on quarterly returns, so the monthly holding period is not applicable for these markets.

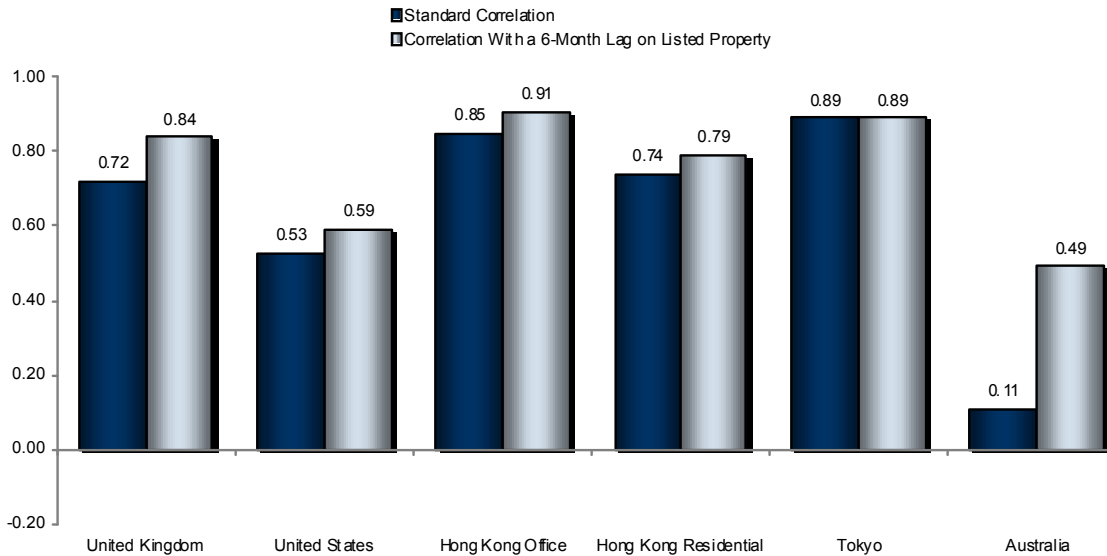
The higher correlations over longer holding periods are likely linked to the main difference between REITs and direct real estate: the packaging, or vehicle, used to own the underlying property. Since the underlying asset of a REIT is real estate, its performance should track that of the underlying property's returns, unless the listed markets are extremely inefficient or the measurement of direct property is wrong.

There are other, more tangible reasons why the performance of listed and direct real estate markets diverges. These include the use of leverage, non-rental income streams, the composition of assets and value creation by active management teams of REITs.

One of the most important reasons why REITs may display lower short-run and greater long-run correlations with direct property series (and the main subject of this paper) is that new information is priced into REIT valuations with a higher degree of efficiency than is the case with direct real estate valuations. This higher efficiency is due to the liquidity of REITs, which improves both pricing transparency and information transfer.

If listed real estate markets lead direct property, then introducing a “lag” into the listed time series should increase its correlation with direct property. Indeed, when we introduced a six-month lag on the listed returns, the correlation between the two increased across all markets, as shown in Exhibit 2.

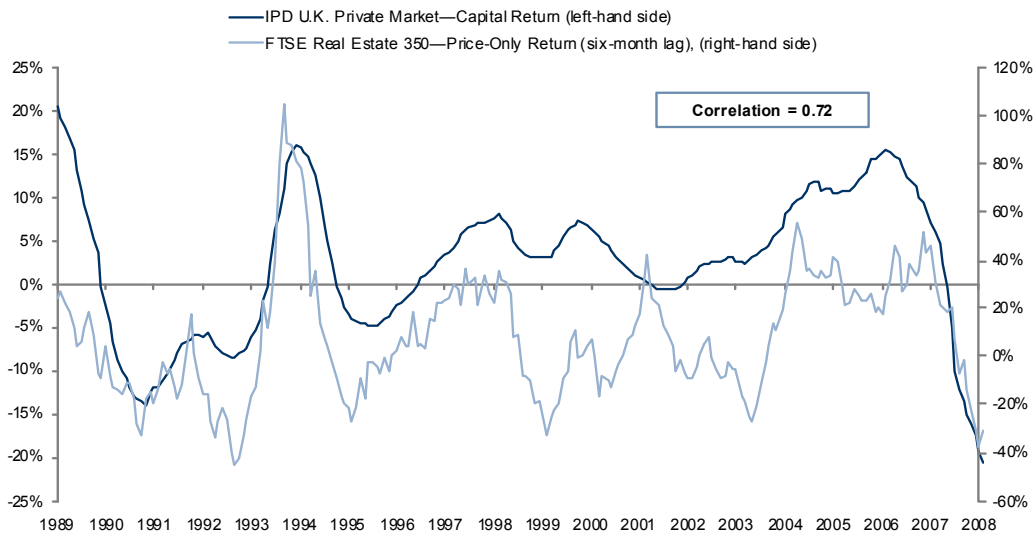
Exhibit 2: Correlations Over Rolling Three-Year Holding Periods, 1995–2008



Source: See Exhibit 1 footnote.

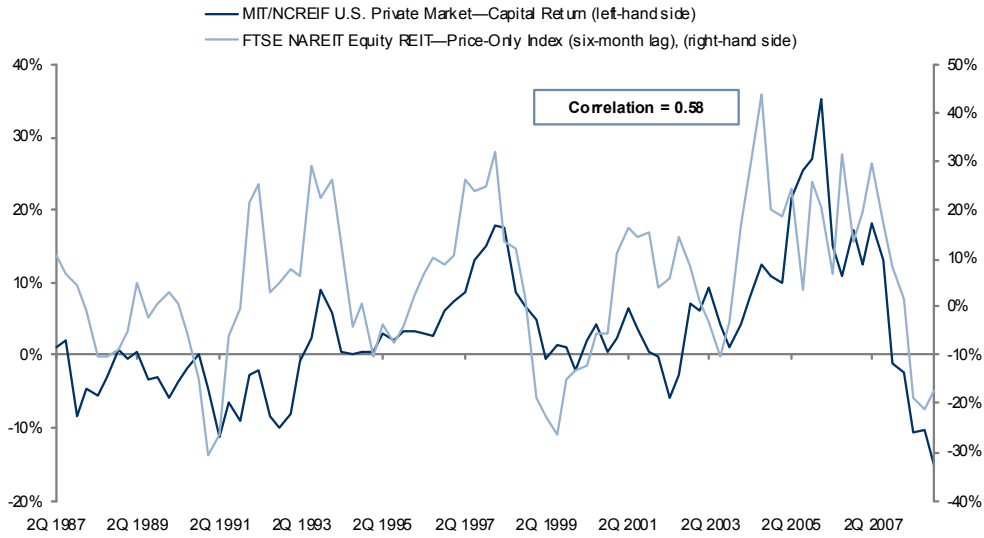
However, correlations simply report a single variable as a measurement of the relationship between the two series. If we compare the lagged listed and direct series visually, we can more intuitively see the strong correlation. Exhibit 3 shows the one-year rolling returns of direct real estate and of listed real estate with a six-month lag in several markets.

Exhibit 3: U.K. Direct and Listed Property Market Performance with Six-Month Lag One-Year Rolling Returns, December 1988–December 2008



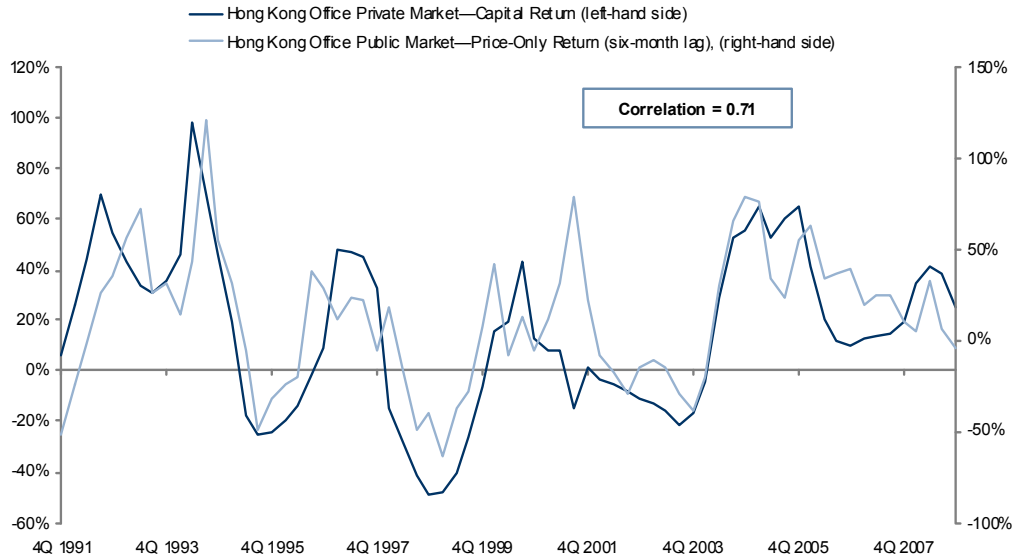
Source: IPD and FTSE EPRA/NAREIT.

**U.S. Direct and Listed Property Market Performance with Six-Month Lag
One-Year Rolling Returns, June 1987–December 2008**



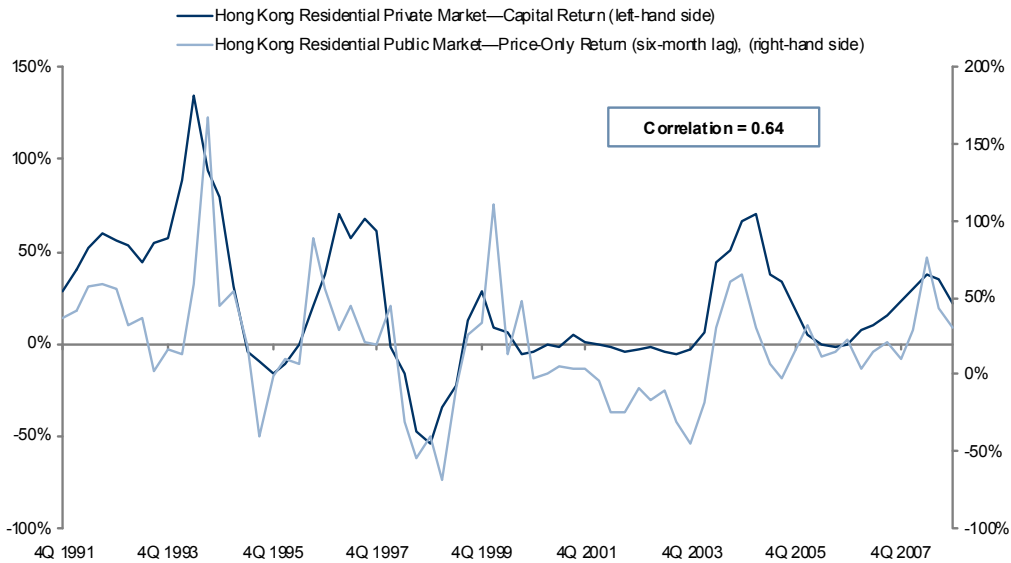
Source: FTSE NAREIT and MIT/NCREIF.

**Hong Kong Office Direct and Listed Property Market Performance with Six-Month Lag
One-Year Rolling Returns, September 1991–December 2008**



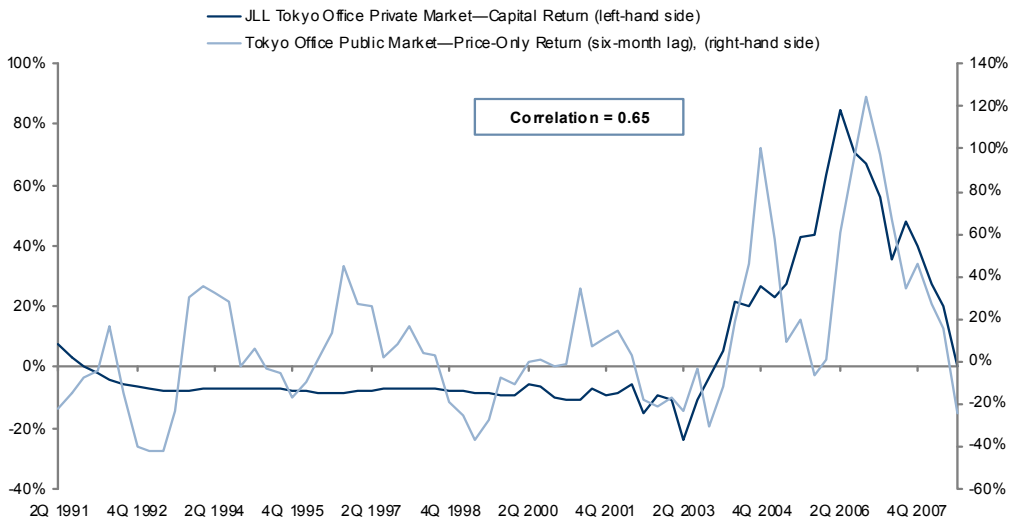
Source: JLL and Bloomberg. As there is no index for the Hong Kong office public real estate securities market, we created one using the weighted average price-only returns for Hysan Development Monthly, Great Eagle Holdings and Hongkong Land Holdings.

Hong Kong Residential Direct and Listed Property Market Performance with Six-Month Lag One-Year Rolling Returns, September 1991–December 2008



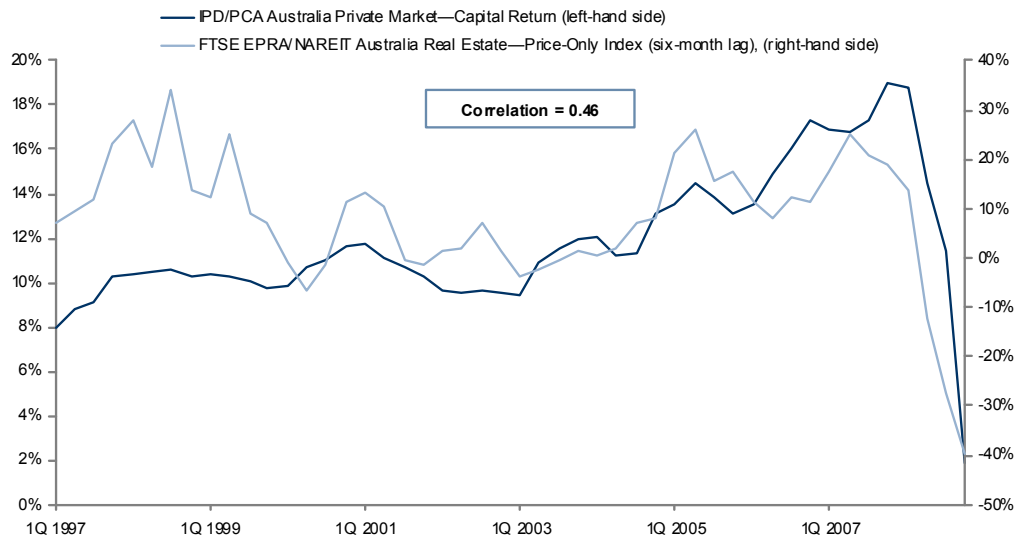
Source: JLL and Bloomberg. As there is no index for the Hong Kong residential public real estate securities market, we created one using the weighted average price-only returns for New World Development, Sun Hung Kai Properties, Cheung Kong Holdings and Henderson Land Development.

Tokyo Office Direct and Listed Property Market Performance with Six-Month Lag One-Year Rolling Returns, September 1991–December 2008



Source: JLL, UBS and Bloomberg. As there is no index for the Tokyo public real estate securities market, we created one using the weighted average price-only returns for Mitsui Fudosan, Mitsubishi Estate, Sumitomo Realty Holdings and NTT Urban. The Tokyo Direct Office market is represented with data from Japan Commercial Land Prices from 1991 through 2000, by JLL for 2000 through 2007 and Japan Commercial Land Prices after 2007.

Australia Direct and Listed Property Market Performance with Six-Month Lag One-Year Rolling Returns, June 1994–December 2008



Source: IPD/PCA and Bloomberg. In the IPD/PCA direct return series, much of the sample is valued infrequently.²

Lack of Correlation for Australian Markets (Relative to Other Markets)

The degree of correlation of the six-month lag depend not only on the effectiveness of listed property as a leading indicator, but also on how well the direct real estate series captures the true value of the underlying real estate. We believe this varies among markets. The Australian returns series comparison may reflect the inferior quality of the direct market index, given the greater inertia by valuers to change capitalization rates, as well as the fact that much of the sample is only revalued on a three-year rolling basis (exaggerating the inherent smoothing problem in the direct return series). However, much of the difference may also lie in the composition of Australian LPTs: many have high levels of non-rental income (approximately 15%), and many own properties outside Australia (approximately 45% of assets). Further, during this cycle, Australian REIT balance sheets have proved to be some of the worst positioned to absorb cap rate decompression, due to tight debt covenants, over payment of dividends, and non-real estate factors such as currency and interest rate hedges. Even with that said, the chart above shows that the Australian REIT market still proved to be an excellent predictor of direct real estate returns this cycle. For a more complete discussion, see “Quality of Direct Market Valuations” in the Limitations to Methodology section.

Listed Property Returns Are Directionally Accurate

While the six-month lag is not a perfect rule that fits all markets, it can be used as an average indicator. The lead lengths may vary, but listed returns often predict the acceleration or deceleration of direct returns well in advance. A list of dates of the most significant peaks and troughs for the one-year rolling period for the U.K. and U.S. listed and direct markets is shown in Exhibit 4. A full analysis of the peaks and troughs is provided in the Appendix.

Exhibit 4: Time Between Listed and Direct Peaks and Troughs

U.K. Market

	1992/ 1993 Trough	1993/ 1994 Peak	1995 Trough	1998 Peak	2002 Trough	2006 Peak
Listed Market	Aug-92	Aug-93	Jan-95	Jan-98	Jan-02	Mar-06
Direct Market	Jan-93	May-94	Dec-95	Jul-98	Jan-02	Jul-06
Lag Time (months)	5	9	11	6	0	4

U.S. Market

	1990/ 1991 Trough	1993 Peak	1994 Trough	1997/ 1998 Peak	2003 Trough	1999/ 2000 Trough	2000/ 2001 Peak	2003 Trough	2004 Peak
Listed Market	Q390	Q193	Q394	Q397	Q103	Q199	Q400	Q103	Q104
Direct Market	Q291	Q493	Q394	Q198	Q403	Q100	Q101	Q403	Q304
Lag Time (months)	9	9	0	6	9	12	6	9	6

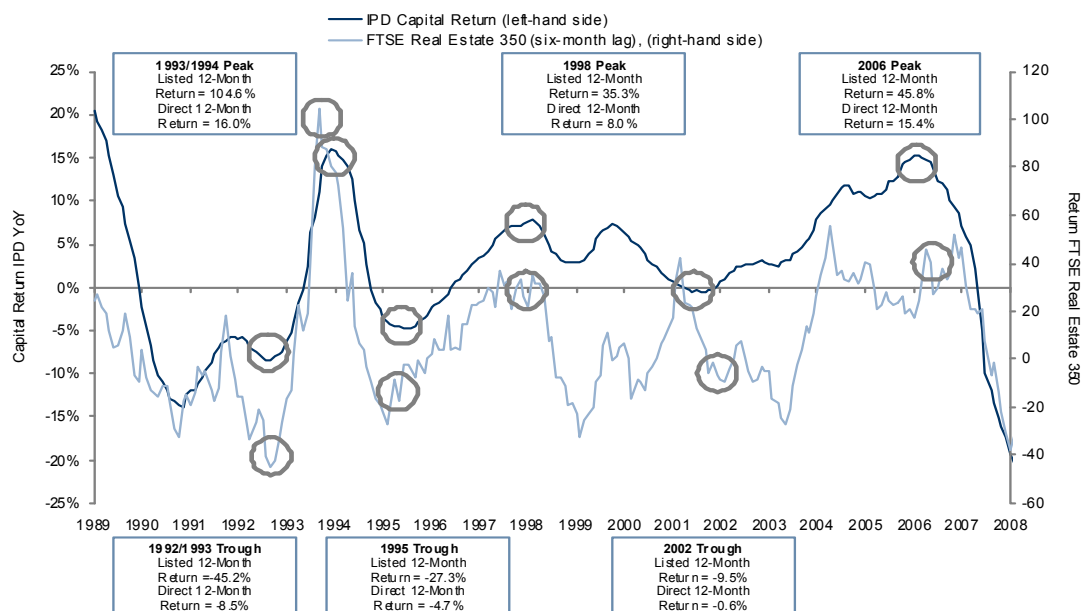
Summarizing the information above, on average, the U.K. listed market reaches its peak or trough six months before the direct market, while the U.S. listed market reaches its peak or trough seven months ahead of the direct market.

Listed Property Returns Overstate Peaks and Troughs

While the returns seem to be comparable, the data show that listed markets overstate the returns that are eventually reported by direct market indexes. In other words, the listed markets experience higher peaks and lower troughs than the direct markets. The over- and understatement of the listed market is mostly attributable to the fact that the returns of the listed property series incorporate leverage, while the direct property series does not (although direct investors also use leverage). Other reasons include the potentially higher cyclical nature of non-rental income streams included in REIT earnings. However, it is also likely that the appraisal-based approach to direct real estate valuation leads to an understatement of true volatility.

The difference between the most significant peaks and troughs for the one-year rolling returns of the direct markets versus those of the listed market is shown in Exhibit 5. A full analysis is provided in the Appendix.

Exhibit 5: Peak and Trough Magnitude Analysis for U.K. Market One-Year Rolling Returns 1989–2008



Source: IPD and FTSE EPRA/NAREIT.

2) Why Listed Property Leads Direct Real Estate Markets

Why would listed markets lead direct property markets? We believe one of the main reasons is the transfer of information—how transparently and how quickly prices are transferred across the market.

Liquidity—Information Transfer

One of the key differentiators between listed and direct property is liquidity. Listed property securities are traded on public exchanges and can be bought and sold daily. The minimum investment requirements and fees are low. These characteristics make real estate securities extremely liquid.

Turnover in the U.K. REIT market for 2007 was approximately 180%. In comparison, direct real estate is much less liquid at only 8% for the IPD sample. This lower liquidity may be related to the large investment requirements—in both capital and time—involved in a direct real estate transaction. While the direct market is almost eight times the size of the listed market globally,² the turnover in the listed market is approximately 22 times the turnover in the direct market. The relatively low turnover in the direct markets means the transfer of information is much slower and more gradual.

Valuing Real Estate: Pricing Transparency

Since property securities have a real-time pricing mechanism, there is essentially no lag between the share price and the market value of the security. Listed property prices immediately incorporate changes in variables, which affect asset value from the macro (interest rates and oil prices) to the micro (expectations for rents and capitalization rates). Valuing direct property, however, is much less transparent because it is valued infrequently. Further, valuations through appraisals are based on a small number of actual transactions. True value is not determined until the property is sold.

² Source: Citi Investment Research.

Furthermore, the direct data series generally includes only a small portion of the direct market. For example, the U.K. direct market data (probably the most robust sample of all direct markets globally) produced by IPD include only approximately 50% of direct property valuations held by institutional investors. In addition, the National Council of Real Estate Investment Fiduciaries (NCREIF) data only include some 10% of the direct property valuations held by pension funds.

Another difficulty in valuing direct real estate is the heterogeneous nature of its assets. A property in one area may have a very different value from one in a slightly different area due to location, floor plan, size, building restrictions, IT infrastructure, the time since its last refurbishment, etc. Therefore, the usefulness of information available to compare the value of properties located in the same market may be limited.

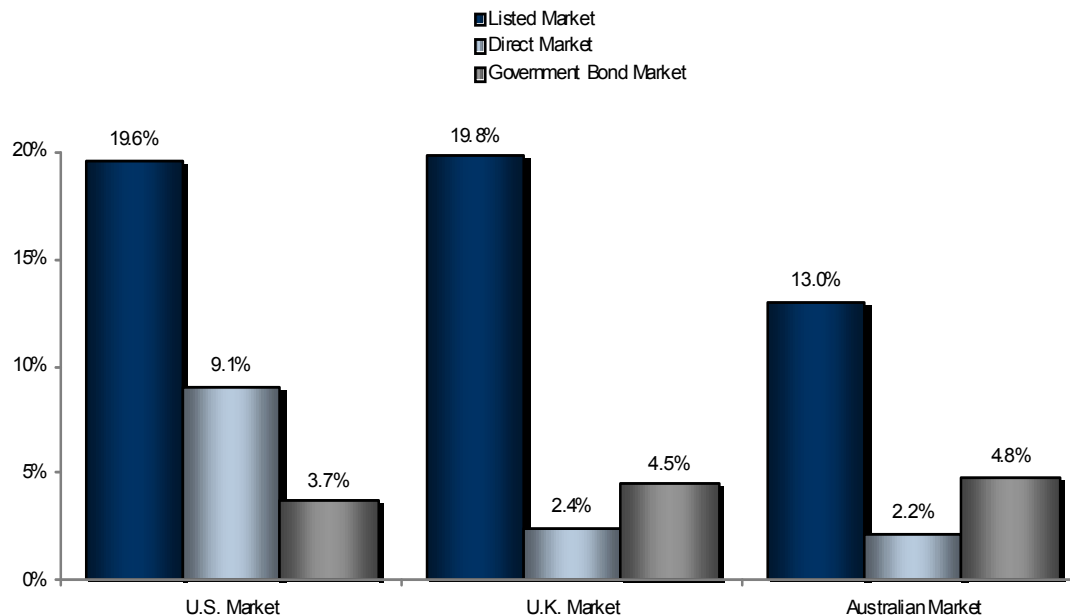
Further, there is no standard way to compare the values of direct property assets. Metrics may include equivalent yield, gross/net income yield, initial yield, reversionary yield, dollar-per-square-foot and replacement-cost. Therefore, because pricing is less transparent in direct markets, the ability of market participants to determine value in a timely manner is more complicated. Also, the lower liquidity of direct markets (as a percentage of the turnover relative to the underlying universe) likely makes the information transfer with respect to price (value) a slower process relative to listed markets, where information transfer is much more frequent and efficient. This implies an increased propensity for direct markets to lag listed markets.

Why would this lack of transparency and information transfer be perpetuated (and perhaps encouraged) by direct market practices? While that is not the subject of this paper, the author does not believe that this is because direct market participants are less intelligent than other investment professionals, or that the fault lies in the “nature of the asset class.” Instead, it is likely that participants are able to enjoy some form of economic benefit, either by reporting less volatile returns to their investors, or from the ability to gain an investment advantage through information asymmetry.

Measured Volatility Is Greater for Listed Real Estate than for Direct Real Estate

The methods that are currently used to value direct real estate distort the measured volatility. The standard deviations of real estate securities in the United States, the United Kingdom and Australia are shown in Exhibit 6.

**Exhibit 6: Volatility of Listed Real Estate Market vs. Direct Market
Ten-Year Standard Deviations at December 31, 2008**



Sources: Indexes reflected are FTSE NAREIT Equity REIT Index for the U.S. listed real estate market, MIT for the U.S. direct real estate market, and U.S. Lehman Aggregate Bond Index for the U.S. bond market; FTSE EPRA/NAREIT U.K. Real Estate Index for the U.K. listed real estate market, IPD for the U.K. direct real estate market, and FTSE U.K. Gilts Index for the U.K. bond market; and FTSE EPRA/NAREIT Australia Real Estate Index for the Australian listed real estate market, IPD for the Australian direct real estate market, and Citigroup Australian Government Bond Index for the Australian bond market.

While real estate securities demonstrate higher stated levels of risk compared with direct real estate, as shown in Exhibit 6, it is likely that the real risk of direct real estate is much higher than the reported risk, due to the influence of appraisal smoothing. Further, most direct investments are leveraged, which would increase their volatility to the end investor.

One indication of this is that, as seen in Exhibit 6, the standard deviations of the direct markets are only slightly higher than those of government bonds for the U.S. market, and lower than that of bonds in the U.K. and Australian markets. This means either that the volatility in direct property approximates that of bonds (in which case expected returns should approximate bond returns) or, more likely, that the measured volatility of the direct markets understates the risk.

This is, perhaps, attributable to the methodology used by the data providers in generating the returns for the direct markets. Direct real estate values tend to exhibit multi-collinearity (returns are highly correlated to past valuations). This violates the assumptions of accepted measurements of risk such as standard deviation, which assumes returns are independent.

3) Implications for Asset Allocation Decisions

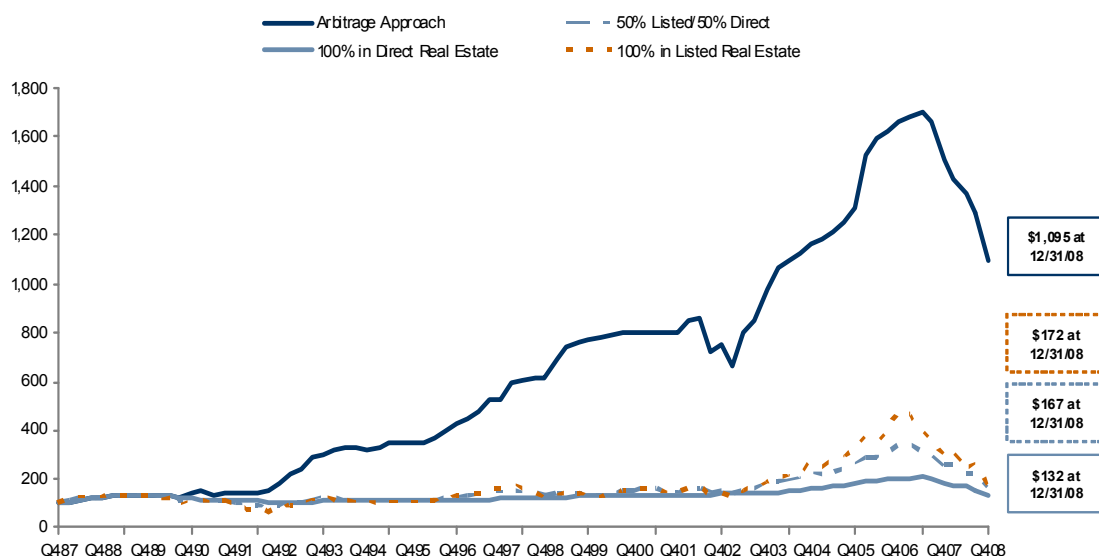
If listed property does indeed lead the direct market, it can then provide valuable information to investors about the direct property market cycle. We outline here two ways investors could utilize this information to enhance the investment returns of their property investments.

Arbitrage Between Listed and Direct Property Investments

An investor with an idealized “perfect” interpretation of the information in Exhibit 4 could have identified 1992 and 2004 as ideal times to make direct property investments in the United Kingdom, as the market was approaching a bottom. Conversely, the 1993 and 2006 peaks in the U.K. listed market would have been an opportune time to sell direct property, as that market was soon to reach a peak.

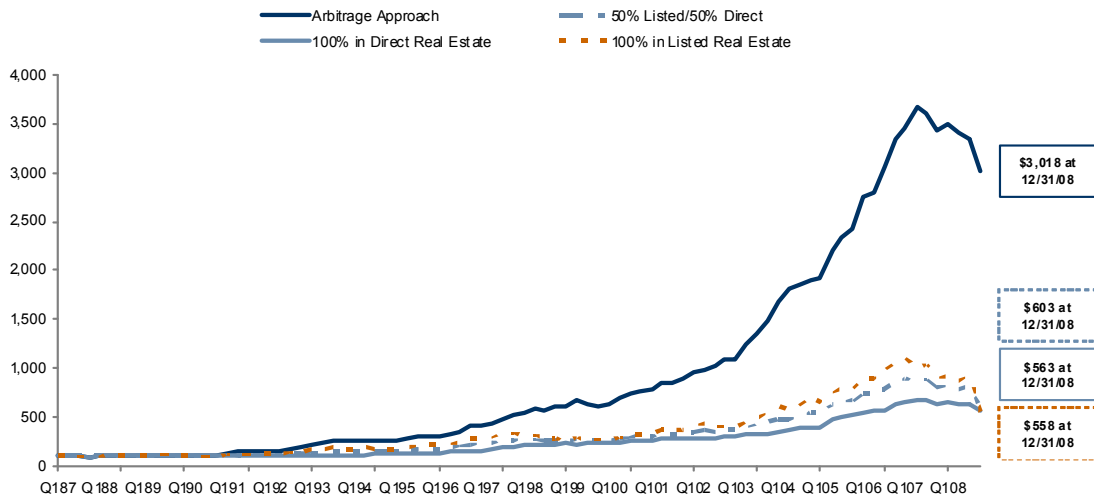
To emphasize the point, we provide an extreme example showing the growth of \$100 in the U.K. and U.S. markets using two real estate investment allocations: one portfolio consists of a fixed allocation of 50% in direct property and 50% in listed property, and the other alternates between investing 100% in direct property or 100% in the listed market, using the listed market as an indicator of when to buy and sell direct property. Using the peak and trough analysis discussed in Section 1, we created a return series that consists of the direct property returns when the listed market hits a trough, and the listed property returns once the listed market hits a peak. Please see the Appendix for further disclosure on this analysis.

Exhibit 7: Growth of \$100 for U.K. Market



Source: IPD, FTSE EPRA/NAREIT and Cohen & Steers.

Growth of \$100 for U.S. Market



Source: MIT, FTSE NAREIT and Cohen & Steers.

Exhibit 7 shows that arbitraging between listed and direct property investments provides a 655% greater return than the fixed 50% direct/50% listed property allocation for the U.K. market, and a 500% greater return than the fixed 50% direct/50% listed property allocation for the U.S. market.

Using Listed Real Estate as a Signal for Direct Investment

Listed markets can provide useful information for tactical decisions with respect to tactically increasing or decreasing direct property weights, or timing strategic allocations. Using the listed market as a leading indicator, investors can identify opportune times to make dynamic allocations between listed and direct real estate.

Exhibit 9 below shows the listed property market was a better indicator of direct market returns than forecasts from the Investment Property Forum (IPF)³, which is a group of market experts including property advisors, fund managers and equity research analysts. Specifically, the listed property market predicted the downturn in 2007 more quickly than IPF forecasters. This is especially remarkable if we consider that by starting the REIT returns six months earlier, the listed market had significantly less information to work with compared to market experts.

³ IPF's "Survey of Independent Forecasts for UK Property Investment." The 27 contributors to the forecasts included 11 property advisors, 13 fund managers and 4 equity brokers.

Exhibit 9: Listed Property Returns vs. IPF as a Forecast of IPD

	Experts Direct Market Forecast Next 12-Month Capital Return	U.K. REIT Next 12-Month Return (six-month lag)	IPD Next 12 Months Actual
August 2006	5.40%	23.05%	4.80%
November 2006	3.44%	22.62%	-5.02%
February 2007	3.48%	0.15%	-13.65%
May 2007	2.54%	-28.64%	-17.49%
August 2007	0.80%	-28.84%	-21.52%
November 2007	-3.99%	-38.27%	-25.85%
March 2008	-5.68%	-29.87%	-30.18% ⁽¹⁾
June 2008	-5.60%	-46.12%	-30.83% ⁽¹⁾
September 2008	-8.05%	?	?
November 2008	-12.36%	?	?

Source: JP Morgan and IPF.

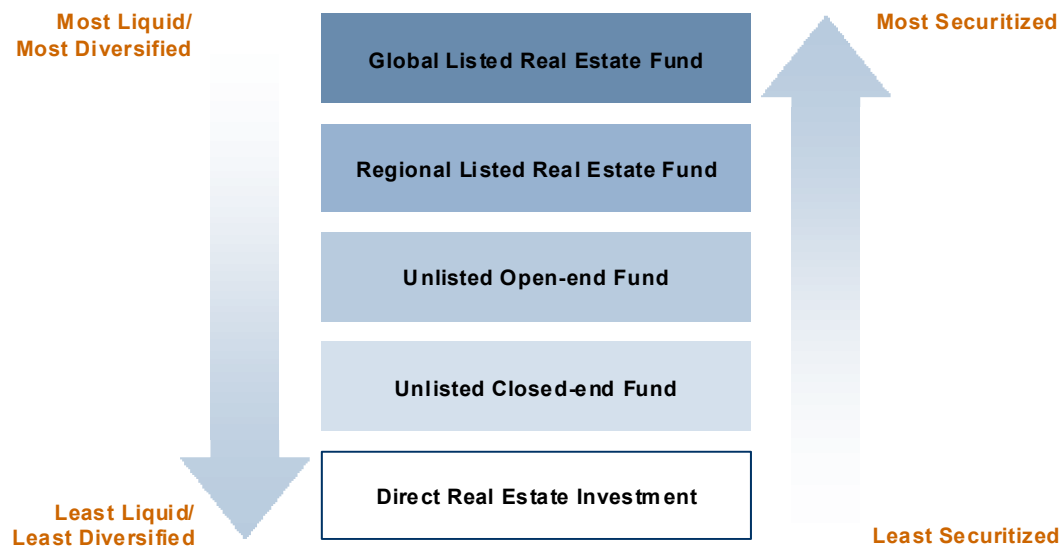
4) Limitations to Methodology

While we believe the findings show the comparison of direct and listed returns provides valuable information that can help investors achieve better outcomes over the long term, there are some limitations.

Timing issues

One issue to keep in mind is the amount of time it takes to buy and sell direct real estate. If it takes more than six months to invest in direct property—the average lead time of listed property over direct property—there may not be enough time to fully benefit from the information gleaned from the public market. This primarily depends on the liquidity of the direct market investment. For example, if the public market is signaling that it's time to buy direct property, but liquidity is tight, a better option might be an unlisted open-end fund. However, practically, as listed markets peak, liquidity is still usually plentiful (helping sell implementation), and in troughs liquidity is scarce, giving equity buyers more opportunities. Therefore, direct market liquidity also depends on the structure of client investments. The liquidity of the various types of real estate investments is outlined in Exhibit 10.

Exhibit 10: Real Estate Investment Options



Another timing issue is how to determine if the listed property market has hit a peak or trough in the cycle. It is possible that returns can experience a minor correction, but then continue the upward (or downward) trend. Additional time may be needed to determine when a trend has run its course. Factors that may help determine if a trend is over include whether the market is closer to the beginning or end of an economic cycle, and the magnitude of the downturn in listed prices.

Quality of Direct Market Valuations

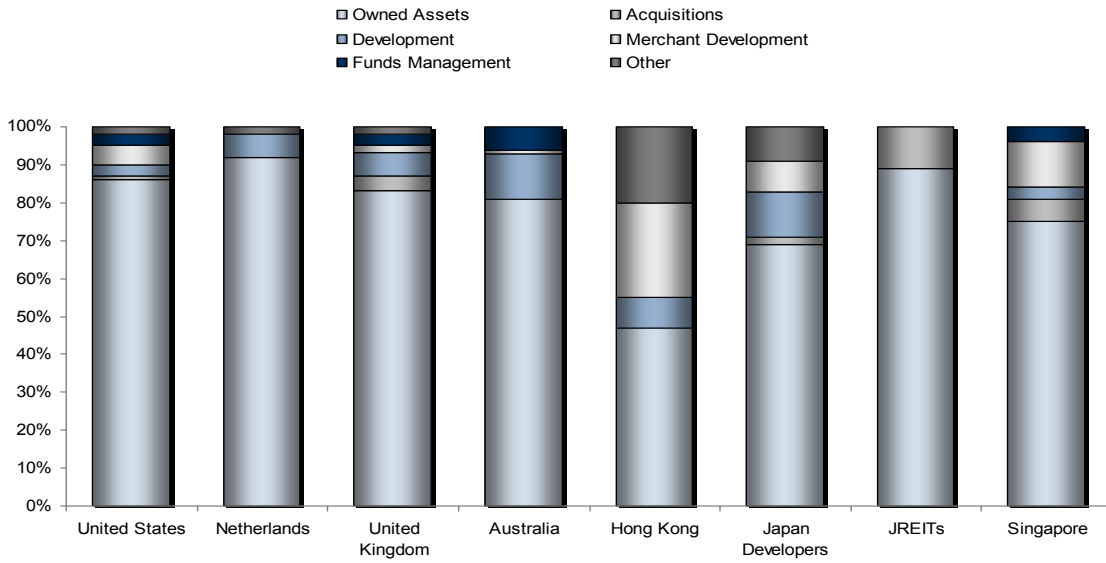
As discussed above under the section “Valuing Real Estate: Pricing Transparency,” there are issues with the quality of the direct real estate data. The United Kingdom places a greater emphasis on valuing direct real estate than many other markets, and therefore may have the highest-quality direct real estate returns (but also potentially the most smoothed). Monthly returns are available for the U.K. direct market, and the pricing is determined by appraiser valuations. In the United States, returns for the direct property market are provided by NCREIF and MIT.

Active Management and Composition

Two of the reasons for the differences in returns between listed and direct real estate markets are active management and composition.

Listed property companies differ from private real estate in that they are dynamic companies with active management teams seeking to add (and sometimes inadvertently detract) value. Management teams can take advantage of changes in fundamentals through acquisitions and disposals, and can undertake development or repositioning activities in markets with improving fundamentals. In addition, these companies are likely to have more sources of income than pure rental revenues, including asset management or transactional income. This varies by region. The breakdown of earnings for several key public real estate markets is shown in Exhibit 11.

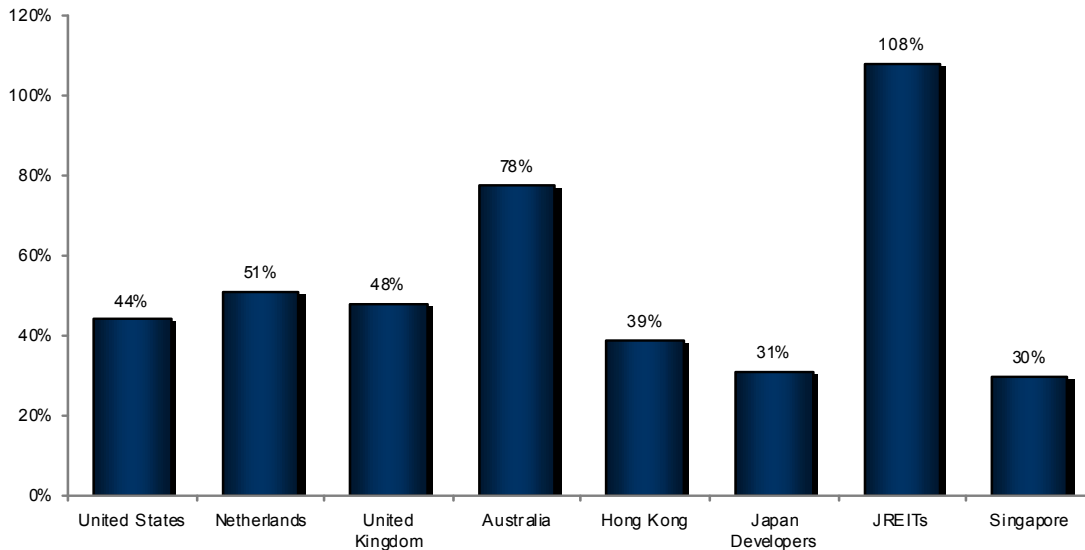
Exhibit 11: Listed Property Markets Earnings Breakdown



Source: Cohen & Steers. At December 31, 2008

In addition, public real estate companies generally use leverage to enhance returns, further differentiating them from direct property (although direct property investors also usually employ leverage). The percentage of leverage employed in the most developed listed property markets is shown in Exhibit 12.

Exhibit 12: Listed Property Markets Debt/Gross Asset Values



Source: Cohen & Steers. At December 31, 2008

5) Conclusion

After comparing listed and direct property historical returns, we found that:

- Listed property companies tend to lead the returns of direct real estate by approximately six months.
- While the listed performance is directionally accurate, the returns tend to overstate the eventual *reported* direct market moves.
- The propensity of listed markets to lead the direct markets may be related to the inefficient transfer of information in direct markets.
- The stronger the factors that delay information transfer in direct markets, the longer the gap between the markets' return series.

We believe that understanding the relationship between the two markets has useful implications for investors. By using listed property returns as a leading indicator of direct real estate performance, investors can meaningfully improve their asset allocation decisions.

6) Appendix

Explanation of Return Data

U.S. Direct Real Estate Return Series

The analysis on the U.S. listed property is provided by the MIT Center for Real Estate (“MIT/CRE”). MIT/CRE has several real estate research functions including the Commercial Real Estate Data Laboratory (“CREDL”). The purpose of the CREDL project is to gather data and measure the performance of commercial real estate, and to develop practical methodologies and tools to evaluate that performance. The index measures market movements and returns based on transaction prices of properties sold from the NCREIF Index database. We believe the MIT/CRE CREDL return series is the most accurate index of the U.S. direct market. Further information on the index can be found at <http://web.mit.edu/cre/research/credl/tbi.html>.

While many people use NCREIF, there are issues with the data. The NCREIF Index is an appraisal-based index, which means the returns are based on appraisal estimates rather than actual prices of actual transactions. The appraisals are provided by private real estate fund managers that report unverified returns on a quarterly basis. The returns are based on each manager’s determination of the change in appraised value plus net cash flow, and not on the returns of a direct real estate fund. Managers conduct their own appraisals and gains and often smooth out losses in value over time.

U.K. Direct Real Estate Return Series

The IPD U.K. Monthly Index measures returns to direct investment in commercial property. It is compiled from valuation and management records for individual buildings in complete portfolios, collected directly from investors by IPD. All valuations used in the Monthly Index are conducted by qualified valuers, independent of the property owners or managers. Further information on the index can be found at www.ipd.com.

Australia Direct Real Estate Return Series

The Property Council's Investment Performance Index has been established for more than 20 years and is Australia's leading and most credible direct property index.

Hong Kong and Japan Direct Real Estate Series

Provided by Jones Lang LaSalle.

Full Peak/Trough Time Period Analysis

U.K. Market

	1990/ 1991 Trough	1991/ 1992 Peak	1992/ 1993 Trough	1993/ 1994 Peak	1995 Trough	1998 Peak	1999 Trough	1999/ 2000 Peak	2002 Trough	2004/ 2005 Peak	2005 Trough	2006 Peak
Listed Market	Sep-90	Sep-91	Aug-92	Aug-93	Jan-95	Jan-98	Jan-99	Aug-99	Jan-00	Mar-04	Dec-05	Mar-06
Direct Market	Apr-91	Jul-92	Jan-93	May-94	Dec-95	Jul-98	May-99	Mar-00	Jan-00	Feb-05	Jul-05	Jul-06
Lag Time (months)	7	10	5	9	11	6	4	7	0	11	-5	4

U.S. Market

	2001/ 2002 Trough	2002/ 2003 Peak	2003 Trough	2004 Peak	2005 Trough	2005/ 2006 Peak	2005/ 2006 Trough	2006 Peak	2006/ 2007 Trough	2006/ 2007 Peak
Listed Market	Q301	Q102	Q103	Q104	Q105	Q205	Q405	Q106	Q206	Q406
Direct Market	Q202	Q203	Q403	Q304	Q105	Q106	Q306	Q406	Q107	Q207
Lag Time (months)	9	15	9	6	0	9	9	9	9	6

Full Peak/Trough Magnitude Analysis

U.K. Market

	1990/ 1991 Trough	1991/ 1992 Peak	1992/ 1993 Trough	1993/ 1994 Peak	1995 Trough	1998 Peak	1999 Trough	1999/ 2000 Peak	2000 Trough	2004/ 2005 Peak	2005 Trough	2006 Peak
Listed Market 12-Month Return	-32.61%	17.66%	-45.16%	104.60%	-27.33%	35.33%	-32.35%	10.91%	-9.47%	55.10%	17.34%	45.77%
Direct Market 12-Month Return	-13.96%	-5.69%	-8.49%	16.00%	-4.68%	7.99%	2.94%	7.32%	-0.61%	11.79%	10.44%	15.39%
Overstatement of Listed Returns	18.65%	23.35%	36.67%	88.60%	22.65%	27.34%	35.29%	3.59%	8.86%	43.31%	-6.90%	30.38%

U.S. Market

	1987/ 1988 Trough	1988 Peak	1990/ 1991 Trough	1991/ 1992 Peak	1992 Trough	1993 Peak	1994 Trough	1997/ 1998 Peak	1999/ 2000 Trough	2000/ 2001 Peak
Listed Market 12-Month Return	-10.32%	4.77%	-30.45%	25.46%	2.99%	29.04%	-10.14%	31.89%	-26.12%	16.52%
Direct Market 12-Month Return	-8.31%	0.72%	-11.21%	-2.07%	-9.99%	8.92%	-0.02%	17.81%	-2.00%	6.57%
Overstatement of Listed Return	2.01%	4.05%	19.24%	27.53%	-12.98%	20.12%	10.12%	14.08%	28.12%	9.95%

Explanation of Growth of \$100

The growth of \$100 graphs show what a \$100 investment would have returned after 20 years using different investment options.

The returns for an investment in listed property uses the returns of that market's listed property index (the U.S. listed index is FTSE NAREIT Equity REIT Index); the returns for an investment in direct property uses the returns of the market's direct property Index (the U.S. direct index is the MIT/NCREIF data series). The 50/50 option is calculated using a weighted average return of 50% in the direct index and 50% in the listed index.

The arbitrage approach uses the return series that is created by using a mixture of the direct and listed returns, depending on the peaks and troughs of the listed index. For example, if the listed market returns reach a trough, the methodology would suggest selling direct real estate, as the direct market will likely follow, and buy listed real estate. At this time the return series in the arbitrage approach would switch from the direct returns to the listed returns.

Authors

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