



Real Estate Derivatives: A Portfolio Management Tool For Success

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February 14, 2012

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Introduction

The Bank for International Settlements estimated the outstanding notional value of the global derivatives markets to be \$790.2 trillion as of June 2011. The physical real property market represents the largest market in the world, estimated between 30% and 40% of the value of the underlying physical capital Fabozzi (2010). Over 30% of the global physical commercial real estate resides in the United States (US), and is currently valued at \$11 trillion. If the US commercial real estate derivative market were to grow to one-third of the notional value similar to the equities markets, the US real estate derivative market would be valued at \$3.3 trillion.

For some, derivatives are viewed as financial weapons of mass destruction, associated with the recent United States (US) financial collapse and scandals resulting from highly leveraged and speculative use of these financial instruments. The most common use of these instruments is, however, in the less publicized area of risk management rather than the negatively charged atmosphere of high stakes betting. A derivative, simply put, is a financial instrument that allows two parties to enter into a relationship where one party gains more exposure to the performance of a specific asset while the other party reduces their exposure to the same asset, without actually trading the underlying asset itself. Until recently, real estate was the largest class of tradable assets for which no major derivatives market existed.

The purpose of this thesis is three fold:

- First, it will explain real estate derivatives, their benefits to institutions and investors, as well as hurdles and risks involved in their usage and the market.

- Second, the thesis seeks to examine why the US has not been able to create a well-developed real estate derivative market, and give a brief overview of why the United Kingdom (UK) market has been successful.
- Finally, investment strategies utilizing real estate derivatives will be explained through examples showing their applications in sample real estate portfolios and case studies.

The U.S. commercial real estate sector is one of the last major asset classes to operate without an active derivatives market place. Derivatives have long been available to investors in other asset classes as hedging, risk management and portfolio re-allocation tools. The development of a fully functioning real estate derivative market is long overdue for the U.S. The significant benefits of real estate derivatives to all real estate investors, regardless of their specific usage of the instruments, could ultimately revolutionize the way assets are managed and how alpha may be achieved in the future. A more transparent efficient real estate market is needed to integrate with the broader capital markets.

One of the key reasons why the US real estate derivative market has yet to flourish is due to the lack of education surrounding the functionality and applicability of these financial tools to investor's portfolios. Educating traditional real estate investors is essential to the evolution and development of a fully functioning derivative market. This thesis seeks to explain the benefits of utilizing real estate derivatives and their applications in portfolio management in order to educate the real estate investor community.

History of Property Derivatives in the US and UK

Historically, real estate investors have used non-real estate derivative products such as currency and interest rate swaps in addition to credit default swaps on commercial mortgage-backed securities (CMBS) products to balance their portfolios. Structured notes linked to real estate investment trust (REIT) indices have also been used. While Tullet Prebon launched initial efforts to offer derivatives on the National Council of Real Estate Investment Fiduciaries (NCREIF) index in 2003, the first property derivative trades in the U.S. did not actually occur until April of 2005 through Credit Suisse's exclusive two year agreement with NCREIF to use the NCREIF Property Index (NPI) index.

In 2005, there were two to three trades based on the NPI with only a few more occurring in 2006. It was apparent at this time that Credit Suisse's exclusive agreement with NCREIF was hindering market growth, as little competition drove pricing to unattractive levels. In October of 2006, six additional investment financial institutions (Bank of America, Deutsche, Goldman Sachs, Lehman Brothers, Morgan Stanley and Merrill Lynch) joined Credit Suisse as licensed NPI derivative dealers. By the end of 2007, estimated trades were approximately \$500 million. These eight to twelve trades were done over-the-counter (OTC) making exact dollar figure details difficult since they were not publicly disclosed.

Up until the end of 2007, several financial institutions, academics and journalists alike produced a plethora of primers, thesis papers, and press releases loaded with research and statistics promoting the real estate derivative market. Since 2007, only the

Investment Property Forum in the UK has produced statistics on trades and current information its real estate derivative market. In 2010, European Financial Management published an article authored by Fabozzi, Shiller and Tunaru on Property Derivatives for Managing European Real-Estate Risk. The paper's discussion on property derivative benefits and pricing while applicable to the U.S. solely focused on the European market. The paper briefly mentions the first Futures trade on the EUREX exchange in February of 2009. It was not until April 7, 2011 that the Royal Financial institution of Scotland published a report championing Exchange Traded Property Derivatives in the UK.

Trading in the US real estate derivative market from December 2007 to December 2011 appears to be quite sparse. Specific statistics on US trades are not easily found making a historical narrative of the market difficult.

In contrast to the US market, a well-documented history exists for the UK real estate derivative market. Though off to a shaky start in 1991 with futures trading by London Fox that failed in market manipulating scandal, the UK market redeemed itself in 1994 with Barclays Bank Property Income Certificate products. In 2005, Deutsche Bank arranged real estate swaps for £40 a swap. Since then, the property derivatives market has expanded in the UK from £850 million to £3.9 billion in 2006 to £7.2 billion in 2007. Outstanding notional volume of real estate derivatives in Q4 2011 per the Investment Property Databank (IPD) was £4.23 billion, a little more than half of trading volume at the market's peak.

On February 9, 2009, Eurex began trading property futures based on the total returns of the IPD UK Annual All Property Index for individual calendar years. The futures have been quite successful since their launch, but suffered greatly during the global

market crash of 2008-2009. The EUREX futures product launch has proved to be successful in mitigating counterparty risk, improving liquidity to the commercial property sector, and attracting more investors to the real estate derivative market.

Why has the UK RE derivative market been more successful than the US market?

The US market is more geographically fragmented than the UK market due to greater diversity in return performance from a market that is five times larger than the UK. While the UK is comprised primarily of one commercial real estate market (around London) with one commercial real estate index (the IPD), the US is comprised of multiple property markets with several indices evolving to track these markets. The greater homogeneity of the UK market contributes to more effective hedging with less basis risk.

The UK real estate derivative market is largely driven by end users, not the financial institutions. This demand has been a key driver for the market to develop in the UK. Portfolio managers, Pension Funds etc. in the U.S. have not actively sought out the derivative products, thus market response has been luke warm to product development. This is demonstrated by the Chicago Mercantile Exchange (CME) Group's decision to drop the S&P commercial office index and solely focus on residential trading with the Case-Shiller Indices (CSI).

In the UK, physical transaction costs are much higher than they are in the US. The UK has a 7.5% transfer tax on the property value in addition to the 3-5% transaction costs charged for acquiring the property. Nonetheless, transaction costs and taxes are

substantial enough in the US that property derivatives make an attractive option for exposure to a property without actually acquiring the asset.

Widespread acceptance of a single benchmark real estate index has also facilitated market growth in the UK, whereas the US has seen a war amongst the indexes that has only confused investors on which is best for their particular investment strategy. The NCREIF index in the US is comparable to the IPD commercial index in methodology, but the IPD covers over 50% of the UK real estate market while the NCREIF only covers 5%.

Overview of Real Estate Derivatives

In order to understand real estate derivative products, a derivative must first be defined. A derivative is an instrument whose price depends on, or is derived from, the price of another asset. A derivative instrument contract between two parties specifies the date the agreement is made, the specific period the transaction is based on, and the actual date the transaction will be settled with payments being exchanged. The contract details conditions (in addition to the dates) of the resulting values of the underlying variables, and notional amounts under which payments, or payoffs, are to be made between the parties. Derivatives allow risk related to the price of the underlying asset to be transferred from one party to another. They reallocate risk over a period of time or among individuals with different risk bearing preferences.

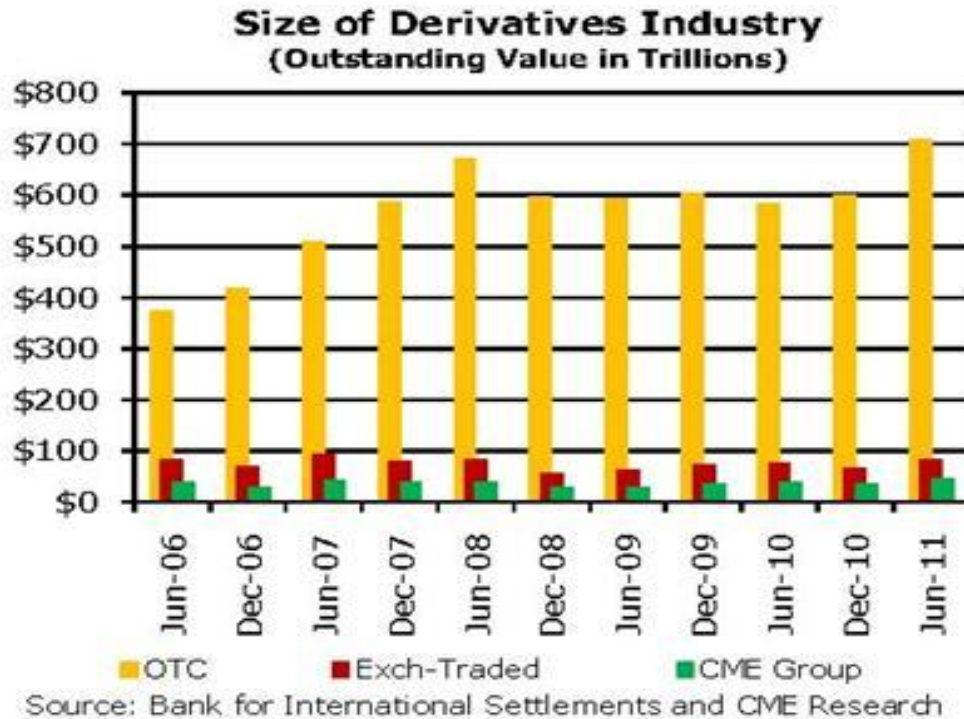
The use of derivatives dates back to 8000 B.C in ancient Greece. The Grecians were essentially utilizing forward contracts by exchanging clay tokens as a promise to deliver a quantity of goods to a buyer by a certain date in the future. A more recent example would be the creation of the Dojima Rice Exchange in 1730. The exchange had two types of rice markets; the shomai and choimai. The shomai market was where actual rice trading took place. Traders bought and sold different grades of rice based on the spot price. Rice vouchers were issued for each transaction and would be settled within four days. The choimai market was the first operating future market. Choimai roughly translates to rice trading on books. In the spring, summer, and fall different grades of rice were contracted with standardized agreements. No cash or vouchers were exchanged; all relevant information was recorded in a book at a clearinghouse and was

limited to a four-month contract period. All contracts had to be settled prior to the closing of the contract period, and no contract was allowed to carry over to another period. Settlement of the differences in value between the current rice spot price and the contract had to be done with cash or an opposing contract position.

Commodity trading in the US in the early 1800s operated similar to earlier centuries. Buyers and sellers would need to locate each other then make an agreement similar to a forward contract. If the prices fluctuated too much the other party would back out of the deal, creating significant counter-party risk. By 1850, the Chicago Board of Trade (CBOT) was established to develop rules and product standards, which allowed the grain market to operate more efficiently, though forward contracts were still in use. Contracts were assignable and speculators began to play the commodities markets looking to cash in on price movements.

The true revolution in commodity trading for the CBOT would not take place until 1865, when standardized futures agreements were introduced with the exchange as the counter party. This is similar in nature to what the Japanese were doing 130 years earlier.

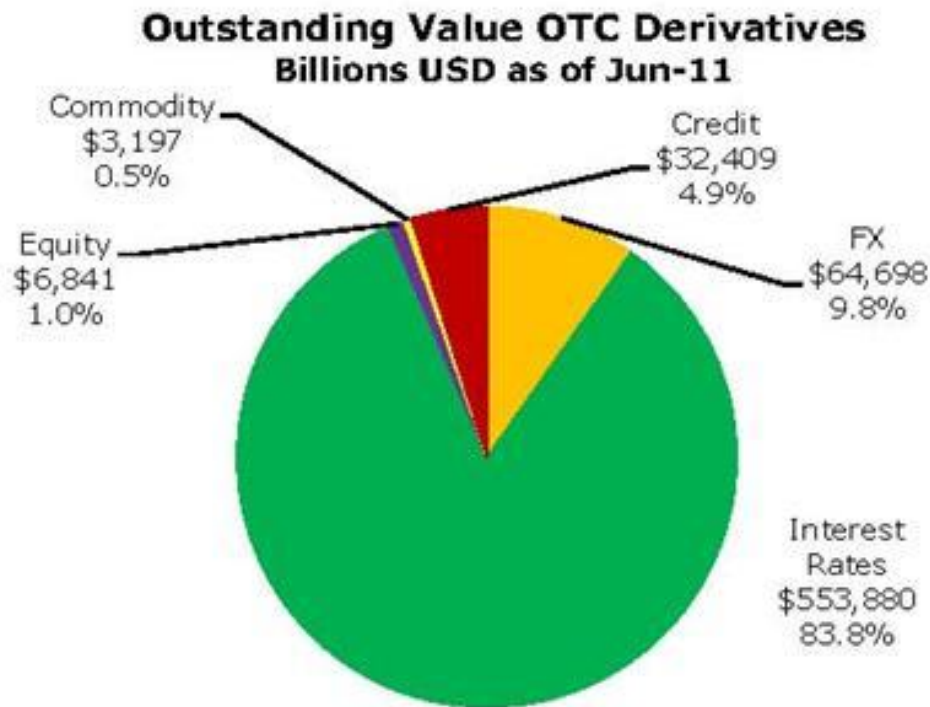
The size of the Outstanding Notional Global Derivative Market is depicted on the following chart:



**Outstanding Notional Value of Derivatives Markets
(Billions USD)**

	Jun-07	Dec-07	Jun-08	Dec-08	Jun-09	Dec-09	Jun-10	Dec-10	Jun-11
OTC Derivatives Markets									
Total contracts	\$507,907	\$585,932	\$672,558	\$598,147	\$594,495	\$603,900	\$582,685	\$601,046	\$707,569
FX contracts	\$48,645	\$56,238	\$62,983	\$50,042	\$48,732	\$49,181	\$53,153	\$57,796	\$64,698
Forwards and forex swaps	\$24,530	\$29,144	\$31,966	\$24,494	\$23,105	\$23,129	\$25,624	\$28,433	\$31,113
Currency swaps	\$12,312	\$14,347	\$16,307	\$14,941	\$15,072	\$16,509	\$16,360	\$19,271	\$22,228
Options	\$11,804	\$12,748	\$14,710	\$10,608	\$10,555	\$9,543	\$11,170	\$10,092	\$11,358
Interest rate contracts	\$347,312	\$393,138	\$458,304	\$432,657	\$437,228	\$449,875	\$451,831	\$465,260	\$553,880
Forward rate agreements	\$22,809	\$26,599	\$39,370	\$41,561	\$46,812	\$51,779	\$56,242	\$51,587	\$55,842
Interest rate swaps	\$272,216	\$309,588	\$356,772	\$341,128	\$341,903	\$349,288	\$347,508	\$364,377	\$441,615
Options	\$52,288	\$56,951	\$62,162	\$49,968	\$48,513	\$48,808	\$48,081	\$49,295	\$56,423
Equity-linked contracts	\$8,590	\$8,469	\$10,177	\$6,471	\$6,584	\$5,937	\$6,260	\$5,635	\$6,841
Forwards and swaps	\$2,470	\$2,233	\$2,657	\$1,627	\$1,678	\$1,652	\$1,754	\$1,828	\$2,029
Options	\$6,119	\$6,236	\$7,521	\$4,844	\$4,906	\$4,285	\$4,506	\$3,807	\$4,813
Commodity contracts	\$7,567	\$8,455	\$13,229	\$4,427	\$3,619	\$2,944	\$2,852	\$2,922	\$3,197
Gold	\$426	\$595	\$649	\$395	\$425	\$423	\$417	\$397	\$468
Other commodities	\$7,141	\$7,861	\$12,580	\$4,032	\$3,194	\$2,521	\$2,434	\$2,525	\$2,729
Forwards and swaps	\$3,447	\$5,085	\$7,561	\$2,471	\$1,715	\$1,675	\$1,551	\$1,781	\$1,846
Options	\$3,694	\$2,776	\$5,019	\$1,561	\$1,479	\$846	\$883	\$744	\$883
Credit default swaps	\$42,581	\$58,244	\$57,403	\$41,883	\$36,046	\$32,693	\$30,261	\$29,898	\$32,409
Single-name instruments	\$24,239	\$32,486	\$33,412	\$25,740	\$24,112	\$21,917	\$18,494	\$18,145	\$18,105
Multi-name instruments	\$18,341	\$25,757	\$23,991	\$16,143	\$11,934	\$10,776	\$11,767	\$11,753	\$14,305
Exchange Traded Derivatives Markets									
All Exchange-Traded	\$95,096	\$79,088	\$81,808	\$57,744	\$63,256	\$73,118	\$75,418	\$67,946	\$82,635
Interest rate	\$86,150	\$71,051	\$73,779	\$52,711	\$57,733	\$67,056	\$69,551	\$61,943	\$75,836
Currency	\$325	\$313	\$390	\$254	\$225	\$292	\$347	\$314	\$385
Equity index	\$8,620	\$7,723	\$7,639	\$4,779	\$5,299	\$5,769	\$5,520	\$5,689	\$6,414
CME Group Contracts	\$42,720	\$39,083	\$37,831	\$27,651	\$30,250	\$34,908	\$38,850	\$36,755	\$44,392

Source: Bank for International Settlements (BIS)



Source: Bank for International Settlements

Common Derivative Contract Types

The most common derivative contract types include (i) futures, (ii) forwards, options, (iii) swaps and (iv) swaptions.

Futures: A future is a financial contract obligating the buyer to purchase an asset (or the seller to sell an asset), such as a physical commodity or a financial instrument, at a predetermined future date and price. Futures contracts detail the quality and quantity of the underlying asset; they are standardized to facilitate trading on a futures exchange. Some futures contracts may call for physical delivery of the asset, while others are settled in cash. The futures markets are characterized by the ability to use very high leverage relative to stock markets. Futures can be used either to hedge or to speculate on the price movement of the underlying asset. A futures contract is a standardized contract written

by a clearing house that operates an exchange where the contract can be bought and sold. Futures differ from forwards in that forwards are non-standardized contracts written by the parties themselves and require an initial margin or collateral to be posted

Forwards: A tailored contract between two parties, where payment takes place at a specific time in the future at today's pre-determined price. No cash is required initially, and the contract is executed on the specified date at the price agreed upon the day the contract is written. Forward contracts are similar to Future contracts, but are traded in the OTC as opposed to an exchange.

Options: Options can be traded OTC or on an exchange. There are two types of options: calls and puts. A call option gives the holder the right, but not the obligation, to buy an asset by a certain date for a certain price. A put option gives the holder the right, but not the obligation, to sell an asset by a certain date at a certain price. The price at which the sale takes place is known as the strike price or the exercise price, and is specified at the time the parties enter into the option. The option contract also specifies a maturity or expiration date. In the case of a European option, the owner has the right to require the sale to take place on (but not before) the maturity date; in the case of an American option, the owner can require the sale to take place at any time up to the maturity date. If the owner of the contract exercises this right, the counter-party has the obligation to carry out the transaction. This is a key difference between options and futures.

Swaps: Contracts to exchange cash (flows) on or before a specified future date based on the underlying value of currencies exchange rates, bonds/interest rates, commodities exchange, stocks or other assets (such as real estate). Three of the most

common types of swaps are an Interest Rate swaps: where interest associated cash flows in the same currency is swapped between two parties, Currency Swaps: where the cash flow between the two parties includes both principal and interest in two different currencies, and Credit Default swaps¹: where credit exposure is transferred on fixed income products.

The diagram below is a visual example of a swap transaction.



*LIBOR: London Interbank Offered Rate

$LIBOR + Spread_{Ask}$ is the price that the intermediary is asking to receive to sell (i.e., pay) the property return index.

$LIBOR + Spread_{Bid}$ is the price that the intermediary is willing to pay to receive the property return index.

$(Spread_{Ask} - Spread_{Bid})$ is the bid-ask spread—it reflects the intermediary's costs of doing business, including compensation for taking risk and creating liquidity (i.e., making the market), plus differences in expectations about future returns.

Swaption: An option on the forward Swap. Similar to a Call and Put option, there are two types of Swaptions: a receiver Swaption and a payer Swaption. A receiver

¹ Credit default swaps were widely blamed for exacerbating the 2007-2008 global financial crisis by hastening the demise of several companies like Lehman Brothers, AIG, and Bear Stearns. In 2008, the global derivatives market was worth over \$516 trillion or about 10 times the value of the entire world's output.

Swaption can receive a fixed amount and pay a floating, and a payer Swaption has an option to pay fixed and receive floating cash flows.

Real Estate/Property Derivatives

A property derivative is a financial derivative whose value is derived from the value of an underlying real estate asset that can be used as a synthetic investment or to hedge risk on an existing investment. A real estate derivative can be easily constructed with a contract agreement made on a certain date providing a claim on one of these underlying real estate indices for a specific periodic return that will be settled on a specified future date in that contract.

Market inefficiencies have made it difficult to accurately price these underlying assets, therefore the property derivative contracts are typically written based on a real estate property index. Property Indices exist for both commercial and residential real estate. Currently there are ten real estate indices used in the U.S. for residential, commercial office, industrial and hotel/lodging assets. These real estate property indices aggregate real estate market information to provide a more accurate representation of underlying real estate asset performance and are discussed in greater detail in following Section.

Real estate derivatives are offered in the form of swaps, forward contracts, futures, and a funded format where the property derivative is embedded into a bond or structured note.

Examples of Current RE Derivative Swap Products

There are several real estate derivative swap products utilized in today's market, including (i) Total Return Swaps, (ii) Property Type Total Return Swaps, (iii) Price Return Swaps, and (iv) value trading-International Trading Geographic diversification.

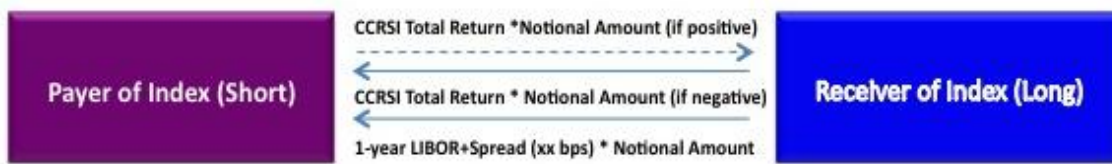
Total Return Swaps (capital appreciation and income growth). In an appreciation return swap, the long investor who receives the real estate underlying index return each period (quarterly or yearly, depending how the contract is specified) in exchange for paying LIBOR plus a predetermined spread (i.e. the bid price) on the notional amount of the contract each period for the duration of the contract. On the other side of the exchange, the short seller agrees to pay (technically sell) the underlying index return and in return receives LIBOR plus a spread smaller than the bid (i.e. ask price). There is no upfront principal exchanged. The swap contract is based on a notional principal amount upon which cash flows to be exchanged are calculated. These trades can take place OTC or on an exchange like CME group, International Securities Exchange (ISE) or CBOE, and would be facilitated by a financial institution, an inter-dealer broker, or both. These intermediaries collect a fee equivalent to the bid-ask spread between the long and short positions.

Typically the contract term will be specified up front and would be for one to five years, with a cash settlement, or marked to market, each period (every quarter or possibly annually) with a net payment from the party on the negative side of the swap to the party on the positive side of the swap, shortly after the index numbers are published.

As an example, a total return swap contract is written where the long side will receive the quarterly CoStar Commercial Repeat-Sales Indices' (CCRSI) National

Composite Index total return at 3% and will pay 1-year LIBOR (1%) plus a fixed spread of 1% per annum (0.25% quarterly), for a total of 1.25% on a notional value of \$10 Million. The long side will receive \$300,000 ($3\% * \10 million) and will pay \$125,000 ($1.25\% * \10 million), resulting in a net cash flow of \$175,000 ($((3\% - 1\% - .25\%) * \$10 \text{ million})$) from the short side to the long side.

The figure below gives a visual example of a total return swap.



The net cash flow for the long investor is the notional amount multiplied by the (CCRSI total return – 1 yr LIBOR - the fixed spread). The net cash flow for the short investor is the notional amount multiplied by (1 yr LIBOR + the fixed spread – the CCRSI total return). Depending on the performance of the CCRSI in relation to LIBOR, the net cash flow could be positive, negative or neutral if they zero each other out. If the CCRSI total return were negative, the long side would have to pay the CCRSI total return to the short side in addition to the 1-year LIBOR and the fixed spread amount.

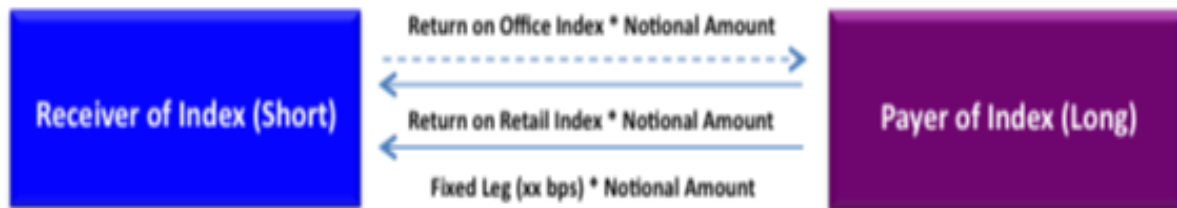
Cash Flow for a hypothetical 1 year CCRSI total return swap

Total Return Swap					
	Notional Amount:	\$10,000,000			
	1-year LIBOR:	1.00%			
	Fixed Spread:	1.00%			
	Term:	1 Year			
Quarter		1	2	3	4
CCRSI Total Return		3.00%	2.00%	1.75%	-0.50%
1-year LIBOR		1.00%	1.00%	1.00%	1.00%
Fixed Spread		0.25%	0.25%	0.25%	0.25%
Long side cash flows (receives CCRSI Total Return, pays LIBOR plus Fixed Spread)					
CCRSI Total Return		\$300,000	\$200,000	\$175,000	-\$50,000
LIBOR		-\$100,000	-\$100,000	-\$100,000	-\$100,000
Fixed Spread		-\$25,000	-\$25,000	-\$25,000	-\$25,000
Net Cashflows		\$175,000	\$75,000	\$50,000	-\$175,000
Short side cash flows (receive fixed Spread, pay CCRSI Total Return)					
LIBOR		\$100,000	\$100,000	\$100,000	\$100,000
Fixed Spread		\$25,000	\$25,000	\$25,000	\$25,000
CCRSI Total Return		-\$300,000	-\$200,000	-\$175,000	\$50,000
Net Cashflows		-\$175,000	-\$75,000	-\$50,000	\$175,000

Property Type Total Return Swaps (capital value and income). Property Type Total Return Swaps are swaps on asset class sub-indices, including industrial, retail, office and residential. In a property type total return swap, the long investor receives the quarterly or annual return of an index's property type sub index from the short investor and in return pays the total return from another property type's sub index plus a fixed spread to the short investor.

As an example, a property type total return contract is written where the long side will receive the NPI Office total return and pay the NPI Retail total return plus a fixed spread of 1% per annum (.25% quarterly) on a notional amount of \$10 million. If the NPI Office return is 3% and the NPI Retail is 2%, the long investor will receive \$300,000

($3\% \times \$10 \text{ million}$) and will pay $\$200,000$ ($2\% \times \$10 \text{ million}$) plus $\$25,000$ ($.25\% \times \$10 \text{ million}$), resulting in a net cash flow of $\$75,000$ ($(3\% - 2\% - .25\%) \times \10 million) from the short investor to the long investor side.



Price Return Swaps (on the capital value return component of an index). Income return is similar to the concept of dividend yield for stocks and capital value return is the same concept of a stock's price appreciation. A capital value return swap is calculated the same as the total return swap. The long investor will receive the quarterly or annual capital value return component of the specified index in return for a predetermined fixed spread to the short investor.

Relative Value Trading-International Trading Geographic Diversification. A good example of this product would be paying UK swap to receive French Total return. Currency aspect of the swap must also be addressed.

These swaps are all contracts of differences. At the settlement, long side's gain/loss is short side's loss/gain. No cash is exchanged upfront. At the end of each specified period over the term of the swap contract, cash payments based on a notional amount are netted and transferred from one side to the other depending on the relative performance of the index versus the other predetermined return measure (fixed rate or LIBOR+ spread).

Examples of Real Estate Futures/Forwards derivative products

Property derivative futures are similar to property derivative swap contracts. The main difference is that property futures are traded via an exchange with its clearing house acting as the central counterparty to each side of any transaction, while property swaps are traded as an over OTC product where you bear the credit risk of your counterparty.

In the US, Forwards are traded on the Residential Property Index™ (RPX) and NCREIF and futures are traded by the CME Group via Globex utilizing Case Shiller Home Price Indices. In the UK, IPD property index futures are listed on the EUREX exchange.

In real life, the actual delivery rate of the underlying goods specified in futures contracts is very low. This is a result of the fact that the hedging or speculating benefits of the contracts can be had largely without actually holding the contract until expiry and delivering the goods. For example, if you were long in a futures contract, you could go short in the same type of contract to offset your position. This serves to exit your position, much like selling a stock in the equity markets would close a trade.

Property derivative futures allow investors to buy and sell commercial property exposure over individual calendar years. Each separate calendar year a contract is made, the investor must deposit an initial margin for the transaction. A typical initial margin might be 8.5% of the notional contract value.

International Swaps and Derivatives Association (ISDA)

Two important differences to note between the various real estate derivative instruments are how principal is exchanged and the need for ISDA documentation. The

International Swaps and Derivatives Association (ISDA) is a trade organization of participants in the OTC derivative market that has created an index of property index definitions and standard transaction templates to facilitate property derivative trading for total return swaps and forwards. The ISDA standard terms definitions booklet and template confirmations save investors time and money by providing boilerplate market standard language for their transactions.

The 2007 Property Index Derivatives Definitions consist of two articles and an Annex: Article I covers general definitions and interpretation; Article II covers adjustments and disruptions to the index; and Annex A provides descriptions of the most commonly used indices and index providers.

Article I provides general definitions for defining and determining the price of the index, when it is published, what events may constitute an “Index Disruption Event”; the index publisher and their role, the amounts payable by each party and when those payments must be made. Article II provides a series of fall-backs for adjustments and disruptions. These cover how to deal with a rebasing of the index; what happens if there is an error in the published level of an index, and/or if the index publisher persists with the error; what happens if there is a delay in publication; and what happens when an index disruption event occurs.

Annex A to the 2007 ISDA Property Index Derivatives Definitions, sets out short hand index names and descriptions of the most commonly traded indices. The Annex will be updated from time to time, and parties incorporating the definitions into a transaction will need to make sure they have incorporated the most up to date annex.

In the templates for total return swaps (which cover synthetic sale and purchases of properties), one party (the total return payer) pays the increase or positive delta in the relevant property index between two dates, with the other party (the total return receiver) paying the amount of any decrease in the value of the index for that same period. For example, if the index value has increased from 95 to 100, the total return payer will make a payment based on multiplying this by the transaction's notional amount. If the index value has decreased from 95 to 90, the total return receiver will make a payment based on multiplying this by the transaction's notional amount. The total return receiver will also pay a floating interest rate linked amount, based on the transaction's agreed notional amount. This is similar to the total return receiver having borrowed this amount to invest in a property, taking the hit of depreciation in any fall of the property value and the benefit of appreciation in an upward market as well. In this arrangement the total return payer plays the role of a synthetic lender.

In each of the two template forward contracts, the derivative transaction is linked to the performance of a specified index (similar to a share index such as the S&P 500 going up or down in value over time), with the difference between the present and future value of the index being settled by the "long party" and the "short party" on an agreed future date. This template is also based upon the transaction's agreed notional amount and involves the on-selling of future property market risk.

The standard templates for swaps and forwards have two different forms: a Form X and a Form Y. The main differences between Form X and Form Y for each transaction type are: Form X applies republication (a reassessment of the index value by the index sponsor), whereas Form Y does not; Form X provides that index prices are linked to

index publication dates and not agreed index measurement periods, while Form Y is the reverse; Form X provides that floating rate interest amounts accrue between the relevant index's scheduled publication dates and are payable with the amount linked to the return on the index, Form Y however provides that amounts accrue during index measurement periods and are payable on the dates specified by the parties.

Both total return swaps and forward agreements require one of these two templates in addition to an "ISDA Master agreement." This agreement is between the investor and the financial institution executing the trade on the investor's behalf. The document contains general terms and conditions such as provisions in the event of default or termination. The swap or forward template document serves as the "Trade Confirmation" where the details of the actual trade are documented, the notional amount, the maturity date of the trade, and the index on which the trade is based etc. References are made back to the Master Agreement regarding definitions and provisions. It is usually a good idea for investors to have a few ISDA Master Agreements with various financial institutions to achieve competitive pricing.

The most basic real estate derivatives are forwards and swaps. Under the swap or forward contract the parties will usually take contrary positions on the price movements of a property index.

In the case of a real estate forward, the buyer (long position) would agree to pay an agreed-upon price, or return on a commercial real estate index at a point in the future, to the seller (short position). The change in the value of the index determines the value of the forward contract at the settlement date. As an example, in a typical equity index forward, two parties today agree to a forward price of \$100 for an index one year from

now. If at the settlement date in one year the index has risen to \$110, the long position nets \$10, the difference between the index and the forward price.

Futures vs Swaps

The following is a list of advantages of using property derivative future contracts on an exchange versus over the counter derivative swap contracts published by the Royal Bank of Scotland in April 2011.

- Virtually eliminates counterparty credit risk- Exchanges guarantee the fulfillment of the contracts by requiring the initial margin and variation margin (RBS April 2011 p 19). The exchange will recoup funds from the clearing member by having them close all of their positions, use exchange fund contributions, use the exchange's reserve fund, and clearing fund contributions from other members.
- Faster trade execution-since a credit line does not need to be established with the bank and templates have been established for trades, the execution time is much faster than a swap transaction.
- Potential for better price execution-while property futures and swaps are similar in structure, they daily pricing between the two might differ.
- Greater comfort from a regulatory perspective-recent regulations made by the Dodd-Frank legislation will make trades more transparent with better accountability for both parties of the transaction.
- Independent monitoring and reporting of trades

Property Index Notes (PINs)/Property Index Certificates (PICs)

PINs/PICs or property linked notes, are funded products i.e. cash is exchanged in the beginning of the trade, as opposed to total return swaps where no principal is exchanged. These fully funded bonds are typically traded in the UK, and are listed on the London Stock Exchange. These bonds (typically AA/AA- rated) issued by financial institutions as Eurobonds or as part of a standard medium term note (MTN) program, pay returns linked to IPD indices with pricing determined by the total return swaps market IPF (2010). The structure of the notes are flexible and are typically determined by the preferences of the investor. The notes can be issued at par or at a premium or discount to par, can pay a regular income coupon, mirroring quarterly rental streams from direct property, and/or mature with a capital payment based on a total return or capital growth index. Structured notes can be attractive to investors as the cash flows may mimic the cash flows from a “real” property investment, and there is no need for ISDA documentation IPF (2010, 5-6). Coupons are given to the buyers linked to the IPD income index return with capital repaid at the end.

Indirect Property Funds-CBRE/GFI group

Indirect Property Funds are unlisted pooled investment funds (closed or open ended) that are managed by an independent third party. This includes private equity-style real estate funds together with sector specific, balanced and opportunity funds.

The root cause of many of the problems with indirect property funds has not been due to the general fall in property values (although in some markets this has been severe), but the imprudent use of debt to grow funds and to magnify returns. This has undoubtedly added to market volatility, and has also contributed to the recent illiquidity in the market.

Real Estate Indices

Currently there are ten real estate indices that measure values for residential, commercial office, industrial and lodging assets in the U.S. There are two major residential indices used for trading, S&P/Case-Shiller² and RPX³. A third residential index, the FHFA HPI⁴, is published quarterly by the Federal Housing Finance Agency.

Housing Price Index. The Housing Price Index (HPI) is a weighted, repeat-sales index, based on the repeat conventional conforming mortgage transactions on single-family detached properties whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac since January 1975. The HPI serves as a timely, accurate indicator of house price trends at various geographic levels. Because of the breadth of the sample, it provides more information than is available in other house price indices. It also provides housing economists with an improved analytical tool that is useful for estimating changes in the rates of mortgage defaults, prepayments and housing affordability in specific geographic areas. The HPI includes house price figures for over 363 metropolises.

Case-Shiller Home Price Index. In May of 2006, the CME Group, formerly known as The Chicago Mercantile Exchange, began listing futures and options contracts (up to 60 months) based on the S&P/CSI. The 23 S&P/CSI track repeat sales of single-family homes for three months at a time with data reported the last Tuesday of every month. CSI futures and options are cash settled to a weighted composite index of US

² Indices can be found on both <http://www.cmegroup.com/trading/real-estate/> or <http://www.standardandpoors.com/indices/sp-case-shiller-home-price-indices>

³ <http://www.radarlogic.com/RPX/rpxtrading.htm>

⁴ <http://www.fhfa.gov/Default.aspx?Page=84>

housing prices, as well as to specific markets in 10 major cities: Boston, Chicago, Denver, Las Vegas, Los Angeles, Miami, New York, San Diego, San Francisco, and Washington, DC.

S&P/CASE-SHILLER HOME PRICE INDICES FUTURES AND OPTIONS CONTRACT SPECIFICATIONS

	FUTURES	OPTIONS ON FUTURES
Ticker Symbol	Composite CUS, Boston BOS, Chicago CHI, Denver DEN, Las Vegas LAV, Los Angeles LAX, Miami MIA, New York NYM, San Diego SDG, San Francisco SFR, Washington, D.C. WDC	
Contract Size	Each contract shall be valued at \$250 times the CSI Index, e.g., if the value of the index for Los Angeles was reported at 267.74, the contract value equates to \$66,936 (= \$250 x 267.74)	One futures contract
Minimum Price Fluctuation (Tick)	Minimum price fluctuation or "tick" shall be 0.20 index points (\$50.00)	Minimum price fluctuation or "tick" shall be 0.10 index points (\$25.00)
Trading Hours	Offered exclusively on the CME Globex electronic trading platform Sundays through Thursdays, 5:00 p.m. – 2:00 p.m. Central Time (CT) the next day	Traded via open outcry in GSCI pit Mondays through Fridays, 8:00 a.m. – 2:00 p.m. CT
Contract Months	Contract months extending out 18 months in the future shall be listed on a quarterly cycle in the contract months of February, May, August and November; contract months extending out 19 to 36 months into the future shall be listed on a bi-annual schedule in the contract months of May and November; and contract months extending out 37 months to 60 months into the future shall be listed on an annual schedule in the contract month of November	
Cash Index Release Schedule	8:00 a.m. CT (9:00 a.m. Eastern Time (ET)) on the last Tuesday of every calendar month. For example, the March 2006 index values will be released on May 30, 2006. These index values will reflect transactions recorded over a 3-month period January 2006 to March 2006	
Last Trading Day	Trading in expiring contract ceases at 2:00 p.m. CT (3:00 p.m. ET) on the business day preceding the index release day for the contract month	
Composite Index Weights	Boston 7.4122%; Chicago 8.8868%; Denver 3.6825%; Las Vegas 1.4802%; Los Angeles 21.1620%; Miami 4.9862%; New York 27.2390%; San Diego 5.5134%; San Francisco 11.7879%; Washington, D.C. 7.8500%	
Cash Settlement	Cash settled on the day the CSI Indices are released. For example, the May 2006 LAX contract will settle to the March 2006 CSI Los Angeles Index scheduled for release on May 30, 2006	European-style, exercised into the associated futures contract
Strike Prices	N/A	At 5 index point intervals above and below previous day's close in underlying futures ¹
Calendar Spreads	Calendar spreads for all 10 regions and the composite	N/A
Regional Spreads	All possible pairs of regions/composite for each contract month	N/A
Position Limits	5,000 contracts	

¹ Strikes at 1 index point intervals will be listed on demand.

Residential Property Index. Radar Logic Inc. trades derivatives based on its RPX, which produces a daily “spot” price tracking movements in housing prices per square foot based on residential real estate transactions in 25 Metropolitan areas in the US. In

2009, the index reported \$3 Billion in trading volume. In 2007, the index was preferred to the Case-Shiller index only because of CSI's high licensing fees according to several investment financial institutions in the market. Originally, six dealers were Radar Logic licensed-Morgan Stanley, Lehman (now Barclays), Merrill Lynch, Deutsche Financial institution, Goldman Sachs and Bear Stearns (now JP Morgan Chase). As of 2012, the only dealer licensed is Barclays. Although, the CBOE Futures Exchange, LLC (CFE) released to the press January 26, 2012 that it has formed a partnership with Radar Logic Inc. to offer futures contracts on specific Radar Logic 28-Day Real Estate Indices. These indices will initially include the National Composite Index covering 25 Metropolitan Statistical Areas (MSA) and Four Regional Areas, Northeast, Midwest, West, and South.

Commercial Real Estate Derivatives. There are currently three types of indices available for commercial real estate derivatives, each with its own methodology for calculating returns: appraisal-based, transaction-based, and rent-based model indices. The rent-based index is based on current market asking rents, lease transactions, inflation and interest rates. The first rent-based model index was introduced in 2008 by ReXX Index, LLC a joint venture between Cushman & Wakefield and Newmark Knight Frank that reports quarterly returns for several office markets in the US. The ReXX index (recently renamed REBOR index⁵) was to be traded on the International Securities Exchange (ISE) Longitude Auction Platform. The Longitude Auction Platform utilizes pari-mutuel technology and pools liquidity across all orders to allow investors to trade derivatives on asset classes that lack a liquid underlying market. Nearly two billion square feet of real

⁵ <http://reborindex.com>

estate in 15 individual metro markets valued at \$2 Trillion dollars are represented in the index in addition to an all Market Composite Index.

The NCREIF Property Index (NPI)⁶ published by the National Council of Real Estate Fiduciaries is widely recognized and the most often used appraisal-based index. The NCREIF indices track the value and income for a pool of U.S. commercial real estate assets owned by pension funds and other tax-exempt institutional investors. The NCREIF Property Index (NPI) consists of both equity and leveraged properties, but the leveraged properties are reported on an unleveraged basis, therefore the Index is completely unleveraged.

In 2005, NCREIF had given Credit Suisse a two-year exclusive right to their indices to create a real estate derivative market. Many analysts agree this arrangement hindered market growth and development by preventing needed competition between investment financial institutions. The lack of competition implied high prices (bid-ask spreads) on contracts offered and a lack of market depth required to create liquidity in the marketplace Clayton (2007).

Fisher and Geltner (2007) discuss the pros and cons of each index type in depth in their article “Pricing and Index Considerations in Commercial Real Estate Derivatives” published in the Journal of Portfolio Management in 2007. Their views on appraisal versus transaction-based indices are explained below.

In an appraisal-based index, periodic returns are determined by the regular appraisal (in the case of the NPI, quarterly) of the properties that comprise the index. This methodology is similar to the way many real estate investment funds report returns, but has

⁶ <http://www.ncreif.org/property-index-returns.aspx>

a few disadvantages. Reported returns exhibit “lag” in the data if all properties in the index are not appraised each quarter. This averaging of past and current data reduces index volatility, but also delays movements in the index relative to movements in actual property market values.

Another disadvantage of appraisal-based indices is that conducting valuations of the entire commercial property market in the U.S. is not feasible. Instead, an index is comprised of a small sample of properties that drive returns. The NPI in particular only tracks properties held by NCREIF members, that are tax-exempt institutional investors, a market share that represents 5-10% of the total investable commercial property market in the U.S. (Total Market Value (millions): \$283,762.4 or roughly 6,865 properties as of 4th Q 2011). Therefore, typical performance results for individual investors may not accurately mirror the risk and return characteristics of the index as a whole.

The second type of index is a transaction-based index, which utilizes a repeat-sales methodology. Repeat sales indices track the change in sales price for properties that have been sold at least twice, the methodology utilized to calculate residential housing price index returns by CSI. Repeat sales indices typically apply standard data filters to ensure salient price comparisons. For example, in calculating index returns, “flipped” properties are typically excluded (all properties in the index must be held for more than 1.5 years), excessively old data (properties with first transactions before 1988), and properties that have significantly increased in rentable building area (greater than 10% increase from prior sale).

Moody’s/REAL Commercial Property Index and Transaction-Based Index of Institutional Commercial Property Investment Performance. The MIT Center for Real

Estate partnered with Real Capital Analytics and Real Estate Analytics, LLC (REAL) to form the Moody's/REAL Commercial Property Index (CPPI)⁷, as well as a Transaction-Based Index (TBI) of Institutional Commercial Property Investment Performance, that tracks sales of properties within the NCREIF Property Index. The TBI is based on a hedonic regression methodology whereas the CPPI is constructed with a repeat-sales methodology. The hedonic-price approach uses regression techniques to control for differing property characteristics, and what is called sample selection bias, to create a constant quality price index. The TBI is published with history going back to 1984 but only at the quarterly frequency, and only at the national level (for the four major property types), whereas the CPPI includes monthly and annual frequencies and more geographic regional breakouts. The CPPI is a variable-liquidity price-change (appreciation return) index, while the TBI includes total return and demand and supply-side indices. A transaction-based index is often considered to be more comparable to stock and bond indices that are transaction based. (<http://mit.edu/cre/research/credl/rca.html>)

Altogether, the Moody's/REAL suite includes 29 indices:

- 1 monthly national aggregate index for all property types
- 12 quarterly indices covering 4 major property types (multi-family, retail, office and industrial) nationally, and for the Western US
- An aggregate of the 10 largest metropolitan statistical areas (MSAs)
- 16 annual indices that cover the 4 major property types for the Eastern US, Southern US, and Southern California

⁷ <http://web.mit.edu/cre/research/credl/rca.html>

Green Street Advisors and CoStar Indices. Two additional repeat sales indices that are new to the market are from Green Street Advisors and CoStar. Green Street Advisors' Commercial Property Price Index (GSA CPPI)⁸ is a real-time series of unleveraged U.S. commercial property values. The key feature differentiating this index from others is its timeliness. The GSA CPPI captures the prices at which commercial real estate transactions are currently being negotiated and put under contract. CoStar's index, the CoStar Commercial Repeat Sale Index (CCRSI)⁹ differs from Moody's in regards to the properties they include in their data as well as the sources of the data. Moody's pricing index does not include sales under \$2.5 Million. CoStar Group's monthly index covers sales transactions from \$100,000 and above and is based off of their own sale transaction data. Since Moody's uses a third party to collect the data, their reports are generated two to three weeks after CoStar releases their numbers.

One advantage of a repeat sales index is that a greater number of properties are included in the calculation of index returns. For example, CoStar and the CPPI attempt to track all commercial-property sales in the U.S. over \$100,000 and \$2.5 million respectively, thousands of properties more than what is tracked by NCREIF. As a result, the CPPI may comprise a more representative sample of the investable U.S. commercial property universe. A disadvantage of transaction-based indices is that reported returns exhibit volatility, or "noise", because valuations are reported as properties change hands, as opposed to appraisal-based indices, which report smoothed returns.

Although appraisal-based indices and transaction-based indices vary in their advantages and disadvantages, there is no one single index that is preferred for all real

⁸ <http://www.greenstreetadvisors.com/about/page/tools>

⁹ <http://www.costar.com/about/CCRSIndices.aspx?id=10491>

estate derivative transactions. However, choosing the right index for a particular investment strategy is critical since the historical behavior of each index varies significantly. The timing and magnitude of return performance for the various indices are very different. The appraisal-based NCREIF index has a smoother return history than the two transaction-based indices as well.

The S&P/GRA has had persistently higher average returns than NCREIF in the past: the index delivered a 6.6% annual price return since 1994, while NCREIF averaged only a 3.5% return. The CPPI index reached peak performance at mid-year 2005, while the NCREIF index peaked in early 2006. The S&P/GRA index hit its peak even later, at mid-year 2006. The CPPI index bottomed out in late 2009 and hasn't returned to pre-market crash levels due to distressed assets weighting it down. The TBI has seen a 19% recovery since the crash however, which demonstrates the true distinction of what each index represents in the market. Clearly, a derivative trader could make "the right bet" on one index, but the same bet could be a losing one on a different index. The relationship between all of these indices and "true" market performance is unclear as highlighted by Naylor and Mansour (2007).

The trend of multiple commercial real estate indices evolving that are competing for investor interest should promote further development of the U.S. real estate derivatives market by improving transparency and pricing. On the other hand, there is a clear incentive to focus trading activity on as few indices as possible, to promote liquidity. The following are examples of likely preferences presented in RREEF's research by Naylor and Mansour (2007, p23) of each potential user group:

- Hedgers who are not investors. For lenders, developers and corporate owners, a transaction-based price return index should be ideal. Such indices should provide the best real-time estimate of changes in real estate market value. An appraisal-based index, on the other hand, may not capture recent price movements. NCREIF's focus on institutional-quality real estate may also be too limited to capture these hedgers' actual real estate exposure.
- Hedgers who are investors. Institutional and other investors looking to hedge their market exposure often use NCREIF as their benchmark. Their existing investments are likely valued by appraisals. Thus, this group may prefer a NCREIF-based derivative to sell real estate exposure.
- Speculators. Those making directional or arbitrage bets will likely prefer the volatility of a transaction-based index. Yet they will also like a market with the greatest interest from hedgers and allocators, as this will be where they will find the most potential counterparties looking to lay off risk. We believe speculators will enter any market with trading momentum, regardless of their preference for volatility.
- Allocators. All allocators are intentional real estate investors who likely think of NCREIF as the benchmark for US real estate performance. Investors looking to switch their allocation across property type and region, or separate alpha from beta, are likely holding a portfolio of appraised properties. For these investors, NCREIF derivatives – available across as many regional and property type sub-indices as possible – would be ideal. Foreign institutional investors looking for US exposure are also likely to prefer a NCREIF derivative. Foreign real estate

benchmarks, including the IPD Global Index and its national sub-indices, are appraisal-based. Derivatives on a volatile transaction-based index, with cash flows exchanged monthly or quarterly, could lead to unpredictable and substantial cash payouts.

According to Naylor and Mansour (2007), they believe institutional investors are likely to be best served by NCREIF derivatives, whether they use them for allocation or hedging purposes. Speculators may prefer volatility but are likely to enter where the bulk of trading occurs. If a stronger market develops in US private commercial real estate derivatives, Naylor and Mansour (2007) believe that NCREIF derivatives will build liquidity first because they meet the needs of those two key constituencies. The group least served by NCREIF derivatives are hedgers whose core business is not real estate investing. These hedgers include lenders, developers and corporate owners. Their preference for a transaction-based index, with a better real-time estimate of value outside of institutional-quality real estate, may spur liquidity on non-NCREIF indices Naylor and Mansour (2007, p23).

S&P/GRA Commercial Real Estate Indices. In addition to the indices at MIT and REAL, Global Real Analytics under Charles Schwab had partnered with Standard & Poor's to create the S&P/GRA Commercial Real Estate Indices (SPCREX™) to be used on the Chicago Mercantile Exchange for futures and options. The S&P/GRA Commercial Real Estate Index, or SPCREX, was scheduled to begin trading on Oct. 28, 2007. The 10 indices tracked commercial real estate prices on a per-square-foot basis nationally for five geographic regions - Desert Mountain West, Mid-Atlantic South, Midwest, Northeast and Pacific West and for each of the four major property sectors - apartments, office, retail

and industrial. The data was provided monthly for three months' worth of transactions each time. While the CME group continues to trade on the Case-Shiller for residential, it appears to no longer use the SPCREX index for commercial real estate based on current products offered by CME group and the S&P.

HQuant HLI Index. The ninth commercial index in the U.S. monitors Hotel performance. HQuant HLI Index monitors publishes 30 weekly and monthly indices on the change in average daily room rate (ADR) by type of hotel, region and metro. The index covers 68% of US hotels at all service level ranges.

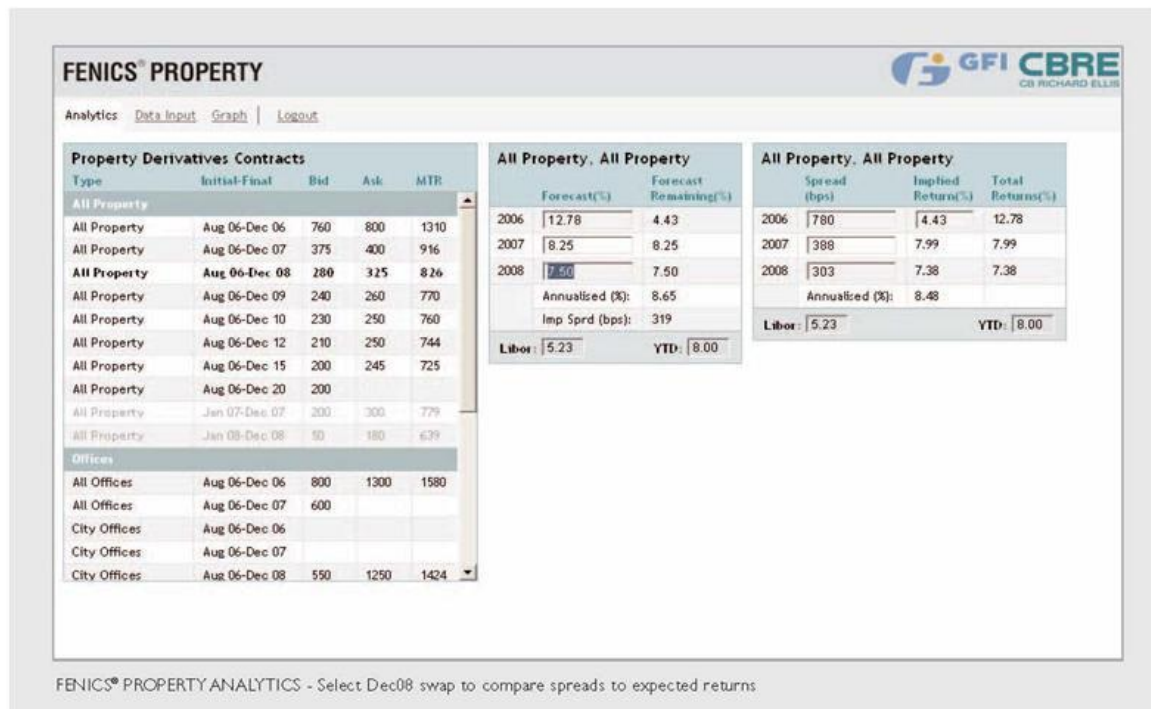
PureProperty. The tenth and more recent of the indexes to hit the market is called PureProperty published by the MIT Center for Real Estate and Financial Times and Stock Exchange (FTSE) as the commercial index partner. PureProperty is an index based off National Association of Real Estate Investment Trusts (NAREIT) data that tracks REIT share prices and holdings. This data is compiled daily and is scheduled to open for market usage later this year.

Trading Platforms

In addition to data published on indices, brokers and analysts have created new electronic trading platforms and analysis tools to assist investors with real estate derivative trading decisions. IPD, ARGUS and Real Capital Analytics have formed a partnership to integrate RCA's global market data into ARGUS Software products. Mutual clients of IPD and ARGUS are able to extract information from ARGUS solutions for direct submission to IPD and for the inclusion of IPD performance statistics. In return, ARGUS users have direct. IPD data provides market information on real estate

investments in 25 countries worldwide and cover performance data on over €840 billion worth of real estate investments.

CBRE/GFI group created FENICS property-a data, pricing and analysis tool for the property swaps market. Designed to improve liquidity by assisting in price discovery and market analysis. Institutions can input their own variables to compare the values of swap spreads and expected index returns.



CBRE/GFI has also recently launched GFI PropertyMatch to alleviate the volatility in pricing and illiquidity issues with Indirect Property Funds. PropertyMatch is a screen based secondary trading platform for unlisted real estate funds. PropertyMatch aims to improve price discovery for both buyers and sellers by allowing market participants to view and post prices for a range of managed property funds. There is a 25 basis point fee for the service only if the trade is settled.

Benefits of Using Real Estate Derivatives

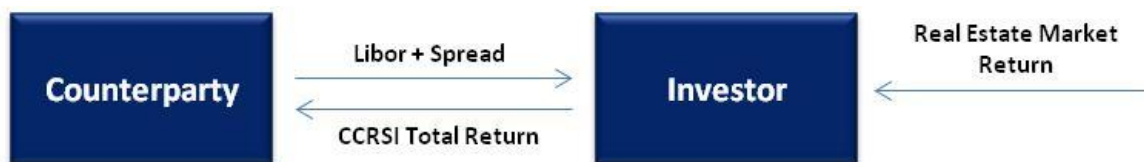
While the benefits and basic uses of derivatives may be well known, the direct application in portfolios may be more difficult to imagine. The following sections explain several benefits of using real estate derivatives and examples of their applications in portfolio management.

Risk Management

Derivatives can be used to lock in “alpha”, or the value that an investor uniquely adds to an investment, by hedging “beta”, or market risk (Geltner 2007). For example, suppose an investor specializes in renovating office buildings in Washington, DC and is successful in selling the properties after their renovation. Typically the investor can add 10% to the value of a property through renovations. However, there would be less incentive to take on any new projects if the investor thought that the local office market was about to soften, especially if there was potential to lose value during a lengthy renovation period. In order to mitigate the local market risk, the investor could sell short a Washington, DC office market index with the notional amount equal to the cost of the acquired property (e.g. assume \$200 million purchase price) and buy the property, effectively purchasing insurance against declines in the Washington, DC office market. If the investor is ready to sell the property in a year, and the Washington, DC office market by chance did not depreciate, the investor will have eliminated local market risk and locked in alpha Clapp (2007).

Hedging a Portfolio

Another way portfolio managers are able to hedge beta risk in their portfolios is through their ability to short property in a derivative contract. All property swaps can be used to hedge general market risk on specific assets or a portfolio of assets. Sector (residential, office, retail and industrial) or sub-sector swaps (i.e. shopping centers, retail warehouses etc.) could be sold to hedge out more specific market risks. Investors could then sell swaps on specific geographic regions and sectors such as luxury single-family homes in San Francisco.



Since pricing in property derivatives is market driven, investors can only hedge against market movements that are not already priced into the forward curve, which makes timing of key importance. Investors can choose to either hedge regularly or for a specific event. If hedging routinely, a constant position must be taken in the market to counteract adverse price movements.

When considering a hedging strategy, a whole portfolio should be taken into consideration. The returns from the derivatives should be combined with expected performance of the overall portfolio. A hedging strategy could help to insulate a portfolio from a downturn in the market if executed at the right time. Figure 2 below shows a comparison of a fully hedged portfolio and an unhedged portfolio during the 2007-2008 real estate downturn in the UK.

Figure 2 Comparison of returns from a hedged and unhedged portfolio 2006-09

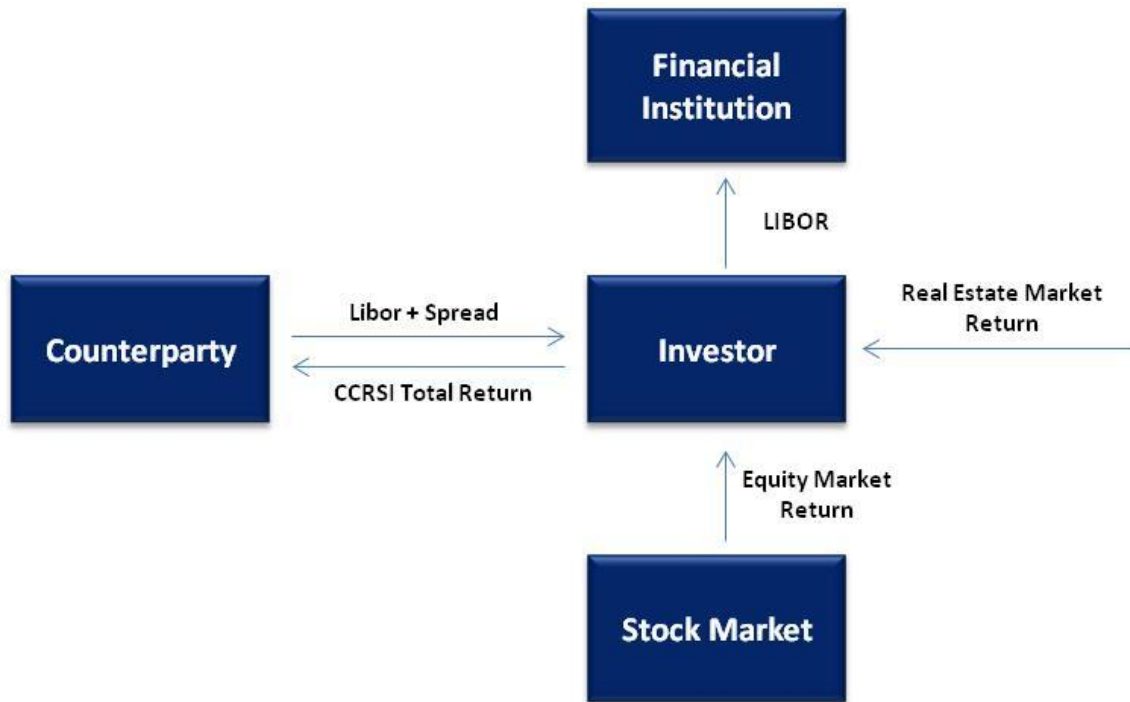


One of real estate derivatives major benefits is that it allows investors to employ short-term strategies that would not have been considered with physical property purchase transactions.

Separation of Alpha from Beta

In theory, derivatives permit the separation of alpha from beta. From an investor's perspective, alpha can come from property level return, and it can also come from manager selection. If an investor found a fund with superior management and property holdings, but didn't like the fund's weight in a particular sector, they could simply invest capital in the fund and then use a sector-focused derivative to reduce their exposure in that particular sector. Portfolio managers can use derivatives to control market sector performance and risk (beta) while concentrating on asset return and risk

(alpha). The manager can then focus on delivering increased performance on the assets they hold directly in their portfolio.



Quick Market Entry

Another benefit of real estate derivatives is that it allows investors to gain exposure to a particular market in far less time than it takes to acquire a physical property asset. For example, suppose an investor would like to invest in a new development project in the Boston condo market. The project will take two years to complete and lease up. If the investor wanted to gain immediate exposure to market gains for this project, a derivative could be used by entering into the long position of a two-year swap with the notional amount being equal to the cost of the development (i.e. the amount to be invested in the Boston condo market). The investor would not exchange cash up front, the contract would be settled each quarter. At the end of two years, the investor will have

benefited from market gains in the Boston condo market during the length of the development while not having to invest in the project in Boston directly.

When investing a client commitment, derivatives can be used to fill the gap in funding as well. Full investment in capital allocations for commercial real estate typically takes a long period of time for deal discovery and due diligence before acquiring a property. As demonstrated in the example above, derivative contracts can provide exposure to full investment of a project from its inception before the property acquisition and development is even completed.

Portfolio Optimization

Derivatives can be useful tools for investors and portfolio managers to maximize portfolio returns. Short selling a stock, in an equity portfolio, provides additional funds to be invested in stocks with higher expected risk-adjusted returns. This “long-short” strategy allows an investor to profit from underperforming stocks, as well as strongly performing stocks, to maximize portfolio returns. Commercial real estate portfolio investment returns could be enhanced the same way, with short selling opportunities. For example, suppose a portfolio manager specializes in industrial property investments throughout the U.S. and is an expert at recognizing turning points (i.e. troughs and peaks) in warehouse markets. The manager believes that the New Jersey industrial market is going to decline in the next few years but is interested in increasing the portfolio’s holdings in the Los Angeles market, which he thinks will be appreciating at the same time. The manager could profit on both the long and short positions by selling short a

New Jersey industrial market index and using the proceeds to increase the portfolio's weight in the Los Angeles industrial market.

Re-Balancing a Portfolio Structure Synthetically

One of the most valuable benefits of real estate derivatives is their ability to give an investor to increased or decreased exposure to commercial real estate without buying or selling the underlying real estate. The fast and efficient rebalancing of multi-asset and property portfolios is an invaluable tool for portfolio managers. For example, a significant decline in stocks or bonds may cause a portfolio to be over allocated in real estate. Rather than selling off properties that are performing well, the portfolio could be synthetically rebalanced by using real estate derivatives to reduce exposure to the asset class.



Obtaining Index Characteristics

Another benefit of real estate derivatives is that an investor can more easily add to a portfolio the same risk and volatility as a desired real estate index, as well as that index's low correlation with other assets in the portfolio. For example, it is impossible for an investor to obtain the identical risk, volatility and correlation as the NCREIF Index (NPI) without owning all of the underlying properties. However, with real estate

derivatives, an investor can obtain the characteristics of the NPI by entering into a swap or purchasing or selling a futures contract on the index (Clapp 2007,7).

Liquidity Management

Liquidity management has been one of the greatest challenges to managers of open-ended property funds over the last few years. Many unitized funds are priced daily and provide high levels of liquidity in the units of the fund. Physical property heavily dominates the underlying assets of the fund. Another key benefit of real estate derivatives is that they allow an investor to obtain the yield, volatility and correlation of a particular real estate market or property type without the cost of acquiring or managing the underlying property, resulting in lower upfront costs and lower management fees. These lower costs are of particular interest to smaller investors without the resources to invest in commercial properties directly. Derivatives also offer greater liquidity than holding commercial property within a portfolio, facilitating quicker execution into and out of investment holdings. This increased liquidity allows more frequent trading, enhancing price discovery and risk-return transparency for the asset class as a whole (Clapp 2007,7).

Increased Allocation to Real Estate

Pension funds in particular, will find the benefits of real estate derivatives in their ability to assist managers in obtaining yields, volatility and correlation of real estate assets at lower costs with higher liquidity. As investors have cheaper and more liquid

alternatives through real estate derivative investments, higher investment allocations to real estate can be obtained without having to solely invest in physical properties.

Another form of leverage

A 5-10% margin of the notional size of the contract is usually paid upfront for a total return swap transaction. If the investor is holding less cash than the full notional size of the contract, this effectively means they are leveraging their exposure to the property in the transaction. Unlike conventional forms of leverage, this type is flexible, as the investor can increase and decrease cash against the derivative, and it is also free. Structured note derivatives can also be structured with embedded leverage. This is especially attractive in the current market where debt is difficult to obtain from financial institutions.

Purchase and exit strategies

Investors in REITs can also use property derivatives to arbitrage perceived mispricing between expectations of returns as implied by the derivatives market and expectations of returns as implied by the premium or discount to NAV. The ability to exit or enter at specific times in the direct market depends upon market circumstances. Derivatives provide a means of bridging periods in which direct transactions do not make sense, for instance, when there are no available purchasers or there is a lack of available stock in a certain sector.

Benefits to Hedgers

Derivative markets historically have been built on hedgers who use derivatives to manage risk. Speculators, in turn, provide market liquidity as a result of their willingness to take on risk. Without interest on both sides, it would be difficult for a market to develop. Therefore, benefits and strategies concerning both natural risk-mitigators and natural risk-takers are discussed below. While hedgers and speculators have opposing motivations for entering the market, both sides face very similar concerns and risks using real estate derivatives.

Hedging market participants are likely to be more exposed to the volatility of the real estate market than they would like. Real estate developers might prefer to gain income from charging fees for their services, not from directional changes in the real estate market. Lenders may seek protection from a significant market downturn that would lead to a surge in defaults. Likewise, corporate and individual real estate owners may prefer to enjoy the benefits of owning their space without being exposed to major market fluctuations. Real estate investment managers may choose to hedge their inherent exposure as a firm to major declines in the market. Investment managers will most likely not short the index in client products, since they are supposed to be in the business of providing real estate market beta.

Benefits to Speculators

For speculators, two potential strategies exist. Either making a bet on the direction of real estate returns and/or looking for relative value across sectors. These

strategies could be utilized by hedge funds, specialty trading desks, real estate portfolio managers, and real estate investors.

Market direction betting is fairly straightforward. Speculators are likely to use derivatives as a way of adding leverage as opposed to allocators, who seek synthetic exposure to the asset class. Investors (like global macro hedge funds) who know less about the industry are more likely to be attracted to an index with diverse real estate exposure. Making a bet on relative value could be executed by a real estate hedge fund that would like to exploit pricing discrepancies across public and private markets. If an office REIT holds a strong portfolio, but the public valuation finds it to be less valuable than the manager’s evaluation, the hedge fund manager could purchase shares of this REIT and at the same time, could short a REIT that appears overvalued compared to NAV. **Exhibit 5 below shows the primary potential applications of real estate derivatives for specific users.**

Exhibit 5
Using Derivatives to Manage Real Estate Exposure

	Benefit	User	Direction	Concerns
Hedgers	Hedge Market Exposure	Lenders, developers, owners, investors	Short	Lack of market risk (volatility), basis risk
Allocators	Gain or Reduce Market Exposure	Investors, especially foreign	Long or Short	Variance in derivative pricing over the cycle, basis risk
	Asset Allocation	Investors, RE portfolio managers	Long or Short	
	Detachment of Alpha from Beta	RE managers, investors	Short	
Speculators	Directional Plays	Investors, hedge fund managers, RE managers	Long or Short	Lack of volatility (market risk), basis risk
	Relative Value (Pricing) Arbitrage	Hedge fund managers	Long or Short	

Source: RREEF Alternative Investments

Hurdles/Disadvantages

There are two separate types of risks involved when examining the US real estate derivative market. There are risks that are market development related that may be preventing the development of a fully functioning derivatives market in the US. The other set of risks are born by the investors themselves while trying to employ a portfolio balancing strategy.

The following is an excellent assessment of market development risks that are impeding the development and growth of a healthy US real estate derivative market by Sandy Naylor and Asieh Mansour at RREEF Deutsche Bank published in 2007.

- Liquidity Risk: Liquidity is a major virtue in any derivatives market, because it allows users to exit a trade before the contractual end date. It also improves derivative pricing for buyers and sellers alike by narrowing intermediaries' profit.¹⁰ Prices are much more transparent in a liquid market, and more choices of underlying index are usually available. Yet until liquidity emerges, potential users may be wary of entering the market. This is a chicken-and-egg problem that tends to lead derivatives markets to be either huge or nonexistent. As of now, there is no definitive data on the volume of derivatives trade in the US, but it is safe to say that significant liquidity has not yet emerged. Anecdotal estimates put the total

¹⁰ Intermediaries can afford to take a smaller cut of each trade if trade volume is substantial and it's easy to find counterparties.

notional value of trades to date at \$500 million, with trades averaging about \$10 million each, but this cannot be confirmed by NCREIF staff or any market participant.

- Basis Risk: Real estate is a highly heterogeneous asset class. The diverse nature of real estate assets makes any hedging strategy much more difficult. Any real estate index available for a derivatives trade may be too broad to reflect the particular local market conditions of the assets to be hedged. The potential gap between the performance of the index and the performance a derivative user wishes to measure is known as basis risk. This problem arising from the heterogeneous nature of real estate will only be solved if index coverage expands to incorporate real estate at a regional, city and, more significantly, local level.
- 'One-Sided' Risk: Demand for real estate derivative trades needs to exist on both long and short positions. Derivatives may not be suitable for hedging losses, both due to basis risk and lack of market risk. At times it may be very hard to find parties to take the short position of a trade. Until this year, virtually everyone has wanted to be long US real estate. The market's consistent surprises to the upside could have discouraged short bets.
- Appraisal Manipulation Risk: Since the NPI includes valuations based on appraisals, its use may raise questions regarding inappropriate appraisal practices or concerns that a data contributor may "game the index." If a NCREIF data contributor is large enough, they may be able to unduly

influence the index by pre-determining which properties are revalued during a particular quarter. If the data contributor accounts for a significant share of the NPI universe, they may have some “insider” knowledge which they can use in placing a trade.

- Index Risk: Finally, the presence of multiple indices may cause some initial confusion which may further hinder the development of a US private real estate derivative market. Scattered trading on several indices would impede the development of market liquidity.

As a follow on to Naylor and Mansour’s assessment of basis risk, Fabozzi *et al* 2007 discusses the incompleteness of property markets as an issue for the real estate derivative market. Fabozzi states that derivatives require homogeneity of the underlying asset for establishing liquidity in their trading. Property derivative markets are incomplete because the primary asset underpinning these markets suffers from lack of homogeneity. Commercial property derivatives differ from major traditional derivative products, such as commodities and financial or foreign exchange futures, in that the underlying asset reference (the real estate index) cannot be traded in cash, or spot, market. This renders the traditional futures-spot arbitrage impossible to execute, undercutting the classic formula for the fair price of the derivative, and raising the need to consider in depth the nature of the dynamics of the underlying index.

In addition to the risks mentioned above, another reason why the U.S market may not be developing at the rate the UK market has could be due to lack of competition from the financial institutions. Not enough competition by the financial institutions that are able to trade on the indices and too many indices spreads the market too thin. Credit

Suisse originally entered into an exclusive two-year agreement with NCREIF to offer derivatives in the form of return swaps based on the index. Lack of competition in the indices implied high prices. (Clayton, 2007) Currently there are only 2 financial institutions licensed to trade the NPI derivatives: Barclays and Deutsche Bank.

The last but not least important impediment to market growth for real estate derivatives in the US can be attributed to lack of education on the market and its products. The active use of real estate derivatives in managing real estate investments may be against the basic rationale for including real estate in a multi-asset portfolio for some portfolio managers. Educating pension funds, portfolio managers and real estate investors across the board needs to improve if the market is to grow.

Originally, investors did not invest in real estate for its returns, but for its potential to diversify the portfolio. As the industry matures, and as the assets become increasingly integrated into the broader capital markets, the liquidity, or lack thereof, of real estate has become more important as an alpha generator and not just as a portfolio diversifier.

Conclusion

The real estate market valued at \$11 trillion represents a large proportion of the total wealth in the US, yet it is one of the last major asset classes to operate without an active derivatives market. Derivatives have long been available to investors in other asset classes as hedging, risk management and portfolio re-allocation tools. The development of a fully functioning real estate derivative market is long overdue for the U.S. The significant benefits of real estate derivatives to all real estate investors, regardless of their specific usage of the instruments, could ultimately revolutionize the way assets are managed and how alpha may be achieved in the future. A more transparent efficient real estate market is needed to integrate with the broader capital markets.

Several examples are given in this thesis for the application of real estate derivatives to specific investor scenarios. While a few hurdles still exist in the US real estate derivative market, the benefits far outweigh the negatives. Real estate derivatives need to find their niche in the portfolio management world in the US and need to be utilized comfortably by investors in order to increase liquidity and confidence in the market. The UK has several success stories illustrated in the cases studies reviewed in this paper alone. As quality of the traded indices improves and knowledge of the uses and benefits of derivatives expands, the market for real estate derivatives should flourish in the US. If liquidity, indexes and pricing is all that is impeding the development of the commercial real estate derivative market, then it is only a matter of time before investors realize derivatives full potential for portfolio management.

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Appendix

Case Studies-Examples from Investment Property Forum's Primer "Getting Into Property Derivatives"

- 1.) Grosvenor Group Limited-Australian test trade
- 2.) Protego Real Estate Investors-Theoretical trade: Hedging a UK property portfolio
- 3.) Scottish Widows Investment Partnership: Shifting domestic property weighting
- 4.) Standard Life Investments: Addressing a sector allocation problem.

Australian test trade

The primary objective of Grosvenor's property derivative test trades, including Australia, has been to ensure and demonstrate sufficient understanding of the market, in anticipation of the use of derivatives for wider commercial needs.

Why property derivatives?

Property derivatives are one component of a toolkit of investment routes through which Grosvenor can manage exposure to property market general returns (beta); thereby allowing us to concentrate on asset specific returns (alpha). The specific uses that we have identified are:

- Temporary portfolio alignment as a stop gap between allocating capital geographically and making physical transactions;
- To improve development competitiveness by reducing market price risk;
- To correct temporary over-exposures to sectors; and
- As a means of managing the property cycle.

As a Group we have a strategy of geographic and sector diversification. We are continually reviewing our optimum exposures and diversification according to beta selection (identifying markets we expect to deliver better risk adjusted returns) and portfolio theory. The optimum portfolio is regularly compared with our actual position, and often intervention is required to keep allocations optimal.

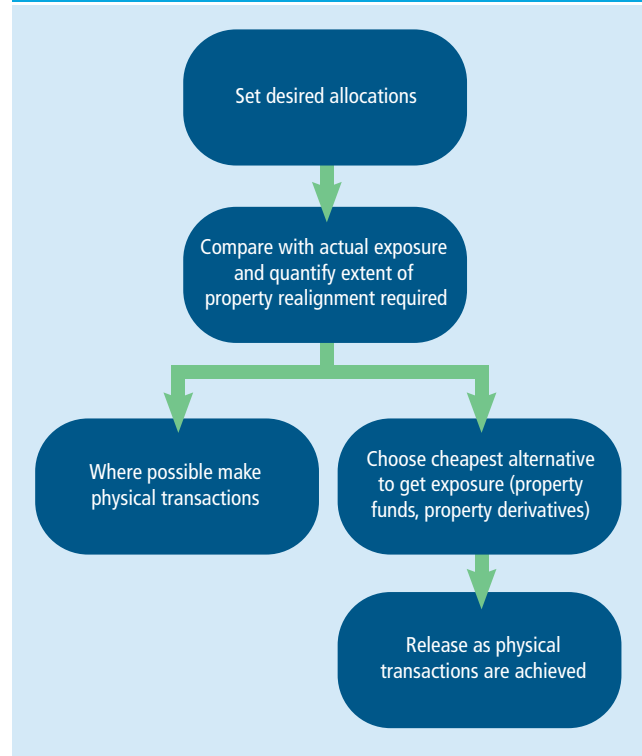
Derivatives fit into this as we see them as a timely and flexible means of shorting or investing in the beta of a selected market. Of course, other avenues exist and therefore our strategy for their use is opportunistic: we only use property derivatives when costs are attractive compared to other investment and divestment options, whether this may be for reasons related to timing, pricing, or the availability of alternatives (for example, property or securities).

Our process for determining the amount we want to trade is outlined in Figure 1.

The costs to be taken into account in choosing between options are as follows:

- Property derivatives
 - Price of derivative.
- Funds
 - Fees, entry costs, exit costs; and
 - Difference between valuations and physical selling price.
- Sale/purchase physical assets
 - Transaction costs; and
 - Difference between valuations and physical selling price.

Figure 1: Process for determining level of trade



Trade execution

This case study considers a trade entered into in order to adjust our exposure to property markets between the regions in which we operate, pending the reallocation of capital into physical assets reflecting our desired exposures.

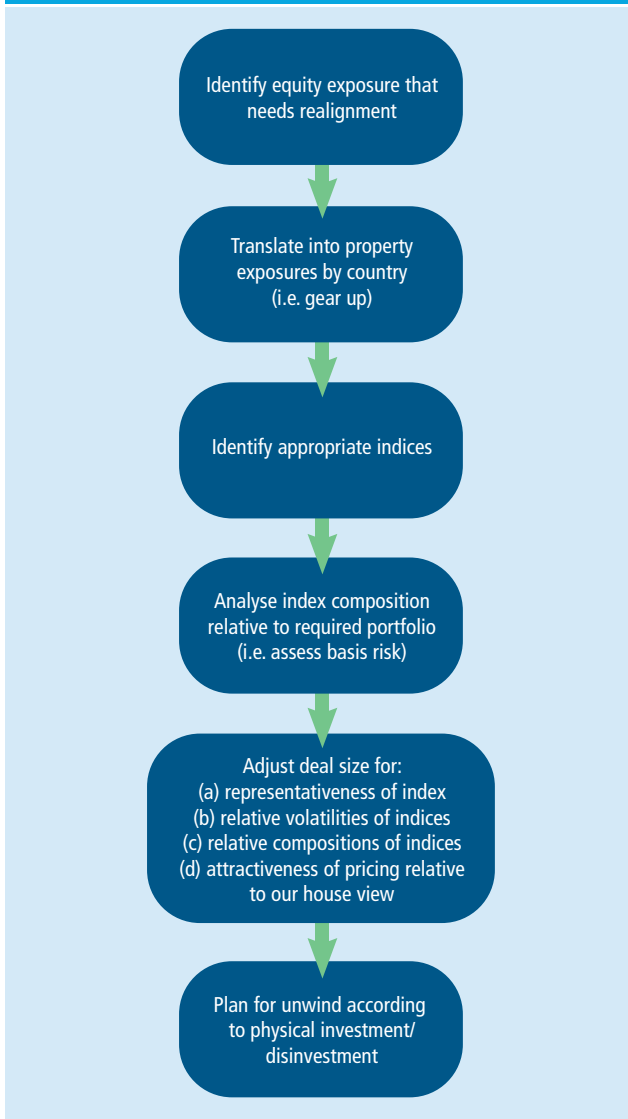
The specific trade, made in May 2007, was the first trade in Australia and our third small test trade (following UK and US, and preceding market firsts in Japan, Italy and Spain).

Our counterparty was ABN Amro, and the trade was for two years from December 2006 to December 2008 on the Australian All Property IPD index.

As this was a relatively small test trade, the focus of our efforts was on the documentation, deal execution, accounting, tax, and legal matters, as well as post deal management and monitoring of trades.

With our test trades we opted for a variety of indices and counterparties so as to get as much educational benefit as possible. We chose Australia partly because, as a long term participant in the Australian real estate sector, we wanted to support the development of the property derivative market. However the overriding objective was capital allocation. Figure 2 sets out the steps that we followed.

Figure 2: Steps followed in the Australian test trade



Some of these steps are considered in more detail below:

- **Index suitability** – This was the first trade on an Australian index. We get a certain degree of comfort from the index being run by IPD, with which we are very familiar. However, we do follow a standard process to ensure we are comfortable with the integrity, coverage, data sources, statistical methodology and other factors of any new index.

- **Pricing** – We will only use property derivatives where the fixed price is favourable to our internal forecasts. While we may expect total return swap pricing to simply reflect a risk free rate; this would only be the case where the index was able to be arbitrated. However, the indices on which the derivatives are based are not hedge-able, primarily because of high transaction costs in property, and valuation lags in the index (as valuers look to historic transactions).

As a result, derivatives are priced primarily according to expectations. We are therefore continually revising our internal expectations and comparing them with pricing in the markets; conscious of the fact that we need to make the trade before the market and our view are aligned.

Hurdles

At the time of the trade there were three barriers to trading in Australia:

- Uncertainty over the treatment of total return swaps in Australian tax legislation. We overcame this by placing the trade in the UK financial market;
- We had some concerns with the documentation that was being used; and
- The index was still undergoing restatement for reasons of consistency. We modified the trade confirmation to reflect this.

Outcome

The trade has settled. Overall it proved another valuable step in our journey to include property derivatives as another part of the beta management toolkit.

Since the trade, a number of other banks have set up trading desks in Australia.

Kelly Cleveland,
Grosvenor Group Limited

Theoretical trade: Hedging a UK property portfolio

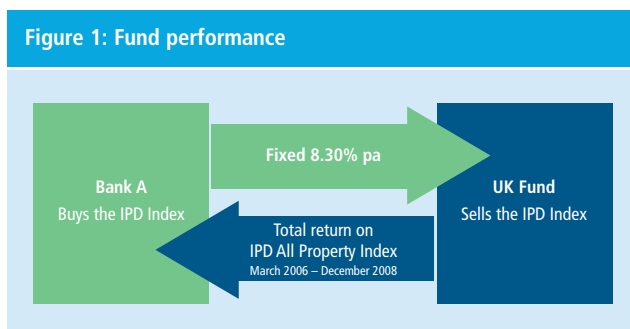
The following case study looks at selling a December 2008 UK All Property swap at pricing peak of 8.30% in April 2006. The aim of this case study is to establish the effect of what could have been achieved in the optimal use of IPD swaps in hedging the performance of a UK Property Portfolio until December 2008.

The continuous double digit capital growth experienced in 2004 & 2005 was also seen in 2006. On top of this speedy increase in capital value, the financing yield gap was narrowing rapidly and secondary yields began to chase prime yields in earnest.

Looking back at the market and considering where property derivatives market pricing was in April 2006 is the starting point of our hedge. In April 2006 the market mid price was 8.30% for a December 2008 contract and for the above reasons looked like a good time and price to hedge IPD property market risk using a swap.

Sell swap – in the old pricing system

Assuming the credit lines and Know Your Client (KYC) have been set up with an IPD licensed bank the December 2008 contract is sold to the bank counterparty at 8.30% per annum. The notional amount is £35m, which serves as a 50% hedge on the portfolio. The contract in this hedge starts from the most recently published IPD Monthly Estimate of the Annual Index in this case 31 March 2006 (1386) expiring 31 December 2008, as shown in Figure 2a.



The fund receives 8.30% per annum from Bank A, in return it pays the IPD Index difference annually for the period of the contract.

2006 Performance

In this case, the index rose from 1386 on the March index to 1566 on the annual index in December 2006, an increase of 13% in total return. Upon settlement the fund pays Bank A £4.55m and receives £2.17m so the fund is down £2.36m net after the first IPD settlement in December 2006 (see Figure 2b).

2007 Performance

When the IPD number is released for December 2007 at 1512, a -3.42% change from December 2006 (1566), the fund receives a payment of £1.2m from Bank A due to the negative return of the IPD index. In addition, the fund also receives £2.90m from the 8.30% return on the £35m notional. So in total the fund is up £4.1m, for the year, after the December 2007 settlement.

Figure 2a: Swap breakdown

	March 2006	December 2006	December 2007	December 2008
IPD Index value	1386	1566	1512	1178
IPD Index change		13.0%	-3.4%	-22.1%

Figure 2b: Hedge Swap

	December 2006	December 2007	December 2008
Notional £35,000,000			
Receive 8.30% per annum	2,178,750	2,905,000	2,905,000
Pay IPD Annual Index for year	-4,546,002	1,198,241	7,735,000
Totals	-2,367,252	4,103,241	10,640,000

2008 Performance

The IPD All Property Total Return index in December 2008 was 1178, an -22.1% difference from December 2007 (1512). The fund receives a payment of £7.73m from Bank A due to the negative return of the IPD index. In this case, the fund also receives £2.90m from the 8.30% return on the £35m notional.

For the period of the hedge swap, the fund is net up £12.37m and as a result added to the performance of the fund.

Alternatively, if the IPD index fell for this period, the portfolio would have maintained a positive position due to the 8.30% hedging the respective fall in value of their fund relative to IPD.

Looking at IPF consensus forecasts June 2008 range and creating scenarios for each provides the following returns:

- At a 2008 total return of -12.20% the fund ends the buy swap up £8.91m net.
- At a 2008 total return of -0.50% the fund ends the buy swap up £4.81m net.
- The actual 2008 total return was -22.1% and the fund ends the buy swap up £12.37m net.

So the market performed much worse than expected.

Conclusions

The fund without a swap in place would have had a geared return of -0.04% for the period of March 2006 to December 2008 and an ungeared return of 2.69%. The performance of the fund, with and without a hedge is shown in Figure 3 below.

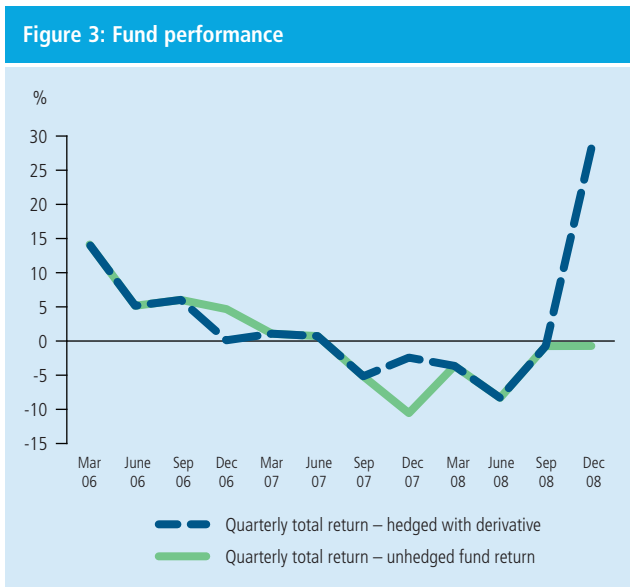


Figure 3 shows that the fund with a hedge in place outperforms the fund without one. The selling of the market for 8.30% increased the fund’s cashflow through the period to compensate for the potential of the market falling below the pricing level of the swap.

The returns on the portfolio are shown in Figure 4 below:

Figure 4: Swap breakdown

Fund returns	Unhedged %	Hedged %
Gearing 40%	0.04	11.48
No gearing	2.69	9.51

The hedge swap was only for 50% of the fund’s size and in this case its performance was improved by a counterparty taking the downside risk for the contract price. Had the market continued as positively in 2007, the fund would have lost out on selling the swap but have been hedged due to its fund potentially rising more in line with the market. If the IPD total return had experienced an unexpected fall, the the fund would have made money on the swap in order to balance the loss in value on the portfolio, hence keeping a hedged position.

To the end of July 2008 the UK IPD Monthly Estimate of the Annual index total return is at -7.74%, by the end of the year this had accelerated to -22.1%. Interestingly, in January 2008 the property derivatives market was pricing in a 2008 total return of -9%, in July 2008 this was -13% and in mid September this was -15%.

The combination of being able to manage property exposure using property derivatives and the absence of stamp duty or agency fees with each transaction suggests that there are real advantages to those who can use property derivatives efficiently as a tool to manage property market risk.

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Maarten Vermeulen,
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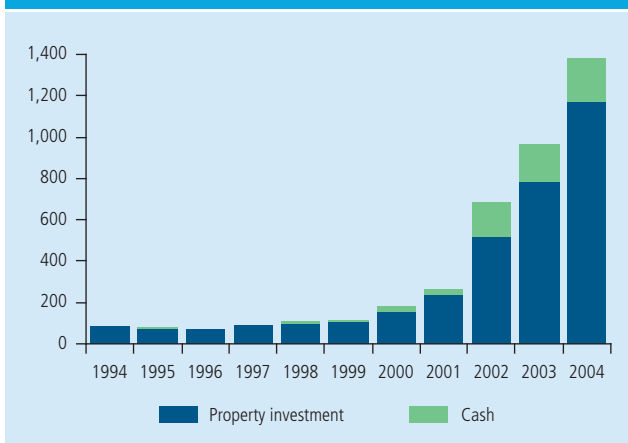
Shifting domestic property weighting

Rationale

In January 2005, the fund in question, a unit linked property fund, was receiving very large inflows of money – so large, that the fund manager was having difficulty in investing it prudently. There were properties available to buy, but not at the right price, or perhaps at the right time.

So cash was building up. Returns from the IPD Annual Index in 2003 and 2004 were 11% and 18%, substantially ahead of cash returns which were around 5%. Investors in this fund wanted their money invested in commercial property, not held in cash, so we, along with similar funds, had a duty to invest it. Uninvested cash was also hurting investment performance – the cash drag.

Figure 1: Unit linked property fund composition



Source: IPD, SWIP

At the beginning of 2005, our internal forecasts for the market were around 8.5% pa for the next three years. The actual outcome for that period was about 10.75% pa. So our forecasts were a touch light – but we were not alone as the IPF Consensus Forecast was equally short; at around 7-8% pa.

The important point here was that we expected property returns to exceed cash returns by around 250 basis points per annum. Consequently, cash in the portfolio would continue to act as a drag on fund performance. Hence the need to invest in an asset delivering property type returns.

With the actual outcome of property returns over 2005-07 being ahead of our forecasts, hindsight shows how important it was to have minimised the amount of cash held in the portfolio.

The solution

This example shows the use of a funded note to increase a fund's allocation to property. Funded means that a lump sum is paid up front for the right to receive a future cash flow based on property returns. It is not technically a swap, but as cash finances the purchase of the note, one is foregoing future interest payments, so the effect is to swap cash returns for property returns.

The reason that a funded note was used as opposed to a swap (whereby cash flows would be swapped between a holder of the property exposure and the fund) was simply because at that time true swaps were not deemed to be admissible. That restriction has since been removed.

We bought a 3-year funded derivative, giving exposure to total returns from all property – in other words, a Barclays Property Index Certificate (PIC).

Derivatives do not incur stamp duty and overall costs for this contract were lower than for the purchase of directly owned property. However, there is no ability to add value with this holding in the conventional sense. But we can take some credit for the alpha generated from the outperformance the PIC had over cash.

The purchase allowed us to reduce our cash weighting in the fund from 21% to 17% – still too high, but a move in the right direction.

Process

Constant contact with the market enabled us to approach Barclays Capital with a view to purchasing a large stake in 3-year PICs. Having dealt with each other before, Barclays Capital was comfortable with our processes and our dealing capability.

Hurdles

Once the issue price was agreed, we had to overcome some further hurdles, as detailed below:

- **Regulatory** – The client fund is a unit linked property fund and all investments must satisfy certain regulatory tests – the admissibility rules (which set out the valuation bases for all investments in an insurance company fund) and the permitted links rules (which detail exactly what type of asset can be bought by these unit linked funds). The PIC that we bought was to have a listing on the London Stock Exchange and hence passed both these tests without further scrutiny.
- **Traditional property investment** – The potential purchase was discussed and debated at our weekly Investment Committee. This covered potential returns, both absolute and risk weighted and compared to cash, the impact on the portfolio etc.
- **Approvals** – In addition to the Investment Committee, approval to purchase any indirect property asset is required from our Chief Investment Officer.

All new derivative products in which any client of SWIP wishes to invest (not just property linked derivatives) must be approved by SWIP's Investment Control Committee. This committee ensures that all parties within SWIP understand the asset, are comfortable with the potential risks and that the back office is able to monitor, value and deal with the cash flows. As we had invested in PICs previously, the approval of the Investment Control Committee was not required.

Outcome

Given the rate of cash inflows into the fund until we bought the PIC, we initially anticipated holding the PIC till maturity.

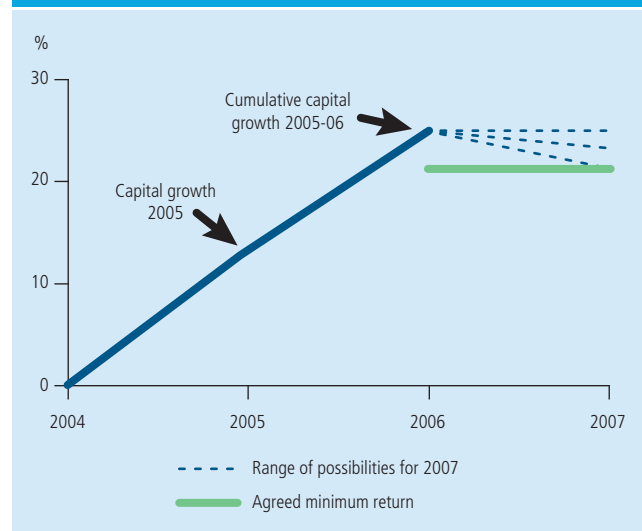
However, as we all know, there was a rapid turnaround in the retail investment market during 2007. From seeing healthy inflows in the first half of the year, our fund, in line with other retail funds, experienced large outflows – over £500m was withdrawn from our fund in the second six months of the year.

The fund still held rather more cash than we normally would have wished. In this instance, holding cash proved to be beneficial on two counts: cash was starting to outperform property; and those exiting the fund could be paid from the cash without the need to sell assets. The latter benefit proved only temporary as withdrawals continued to rise, and we had to find suitable liquid assets for sale.

Although the PICs' exposure to property ended in December 2007, maturity proceeds were not due to be settled until March 2008 (after the publication of the IPD Annual Index). Our cash requirement proved to be rather more immediate.

We negotiated with Barclays Capital to redeem the bulk of the proceeds in late December, with any balance being settled in March. The December proceeds (shown in green in figure 2) were determined by applying a conservative estimate of the end

Figure 2: Cumulative IPD All Property capital growth 2005-07



December capital value. This outcome was based on the known capital movements to end November based on the progress of the IPD Monthly Index at that time, together with estimate of the likely movement over December and in addition, the possible difference between the outcome of the IPD Monthly Index and the IPD Annual Index was estimated. Figure 2 shows a spread of possible outcomes of the capital value decline over the year based on our forecast of the Annual Index (shown in the dotted blue lines). While obviously not exhaustive, this spread indicated what the anticipated lowest outcome for the year (and consequently for the entire three year period) would be. Proceeds amounting to approximately 90% of this estimate were paid out in December with the residue being paid in March, once the Annual Index figure was known.

Stewart Cowe,
Scottish Widows Investment Partnership

Addressing a sector allocation problem



Rationale

This case study is based on a trade undertaken by the Select Fund in 2007. The Fund's performance target is CPI +5%. The investment policy of the Fund is to invest in primarily: commercial property, property-related equities, property investment companies and other property collective investment schemes. The Fund is also permitted to invest in fixed income and cash. At the date of the trade the Fund was looking to increase its office weighting and reduce its overall UK market exposure. In Europe (ex. UK), the Fund had a weighting of slightly less than 2% in offices which it was looking to increase closer to 5%.

Figure 1: Fund sector allocation by country – February 2007

	Office %	Retail %	Residential %	Industrial %	Other %	Total %
UK	7	9		4	2	22
Europe (ex UK)	2	3	2	4	5	15
Hong Kong, Singapore, Asia	6	4	4		3	17
Japan	7	3	5		3	18
Australia	2	3	1			6
USA	10	10			1	21
Total Property	34	33	11	9	12	99
Bonds/cash					1	1
TOTAL	34	33	11	9	13	100

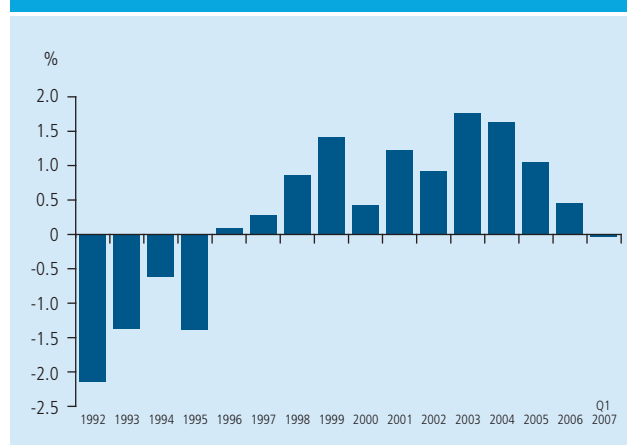
Note: Numbers in the table may have been rounded up or down, so may not match the totals exactly.

The derivative trade was executed in early 2007 and so the numbers and forecasts all relate to our outlook in a somewhat more optimistic period. At this point, our property house view, structured around the Property Research team's global property market forecasts, suggested the Paris office market would outperform most other European office markets over a 3-year hold period. The forecasts suggested that the strongest year of performance from the market would be 2007. The house view also favoured the French office market in terms of liquidity and transparency.

Select could increase its French office exposure through four routes:

- Buying shares in a French listed company;
- Purchasing a physical building;
- Co-investing through a private fund; or
- A synthetic investment using a derivative.

Figure 2: Prime Paris office yield margin over benchmark bonds



Source: SLI, PMA, Datastream

The Listed team's global pricing matrix suggested that French listed property stocks looked over-priced at that stage in the cycle. Dividend yields were down as low as 2% on average and NAV premiums were at a record high. A further consideration was that most stocks in the French EPRA universe were diversified across sectors and did not offer specific French office exposure.

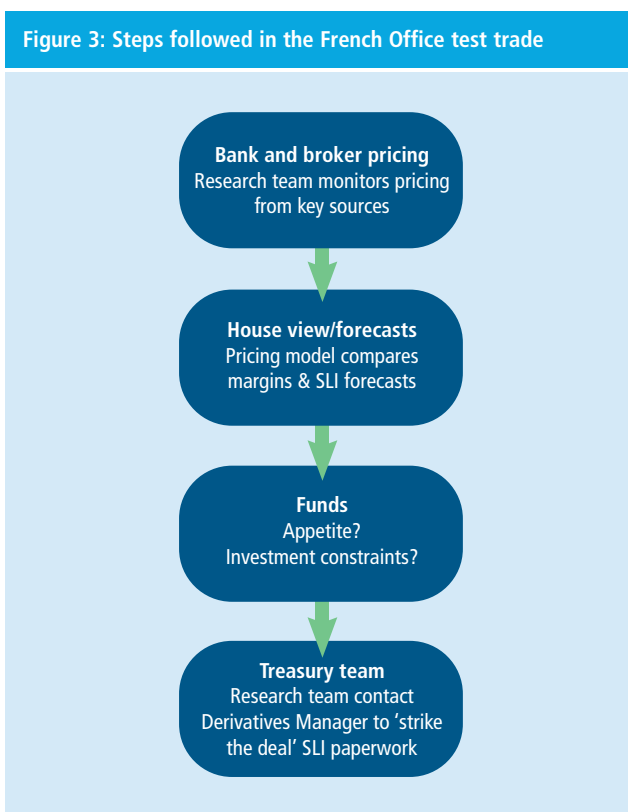
The fund manager also considered buying directly in the market, i.e. a physical building. However, in addition to the obvious high transaction costs, prime yields were at historic lows. Appraisal yields on direct assets in Paris were below 4% at that time. The other consideration was the relatively small size of the investment into the market that Select was targeting. Would one asset represent the returns from the Paris or French office market as a whole? Clearly not. What it would do is introduce asset specific risk to the Fund. Direct assets considered at this stage were also not tax efficient for Select and SPV discounts for latent CGT were not competitive.

Reducing asset specific risk could have been achieved by co-investing in a private vehicle. At this point the Research team could not identify any fund raising vehicles targeting French offices specifically which would have been fully invested in 2007 to capture the strength of returns forecast for the year. Had a fund been identified, fees may have been punitive and would have deterred investment via this route.

Having ruled out the other three investment routes, a derivative based on the IPD French Office Index satisfied most requirements for the Fund: it provided market level exposure (i.e. no asset or company specific risk); it would be tax efficient and transaction costs were low. The Fund therefore agreed an IPD France Office total return swap. Standard Life Select Fund would make quarterly payments of Euribor + a margin and receive the annual total return (capital and income) on IPD France Office.

Process

Standard Life Investments' experience to date of trading derivatives has very much been as a result of our in-house teams working together: Property Research, Treasury, Tax & Fund Structuring, Mutual Funds and Legal. The process internally has evolved through experience – both positive and negative. Responsibility and powers to trade are clearly understood within the teams.



The process begins with the Property Research team who receive, collate and analyse pricing from a range of sources. A pricing model cross checks bid and offer margins against property market forecasts to highlight any potential mispricing and opportunities. This analysis is then communicated with fund managers who are in control of their respective fund's power and appetite to trade. At this stage the Treasury team, with the benefit of key contacts within a range of banks, will strike the deal within the boundaries of appropriate counterparty risk and ISDA agreements. The paperwork process will also kick off at this point. A range of teams across the business are involved to ensure all required documentation is signed and in place with all internal parties required for dealing and on-going support informed of what is required. Compliance, Risk and Trustee approval are all also required to proceed.

Hurdles

Select is an authorised property unit trust which operates under the COLL (Collective Investment Schemes sourcebook) regime therefore it is critical that the Fund's investment in any instrument supports permitted link status in order that they qualify for unit-linked life and pension business as appropriate.

During this trade various hurdles were overcome, not least of which was internal roles and responsibilities regarding by whom and when a trade is actually struck. Experience tells us that the Treasury team and Derivatives Manager are the experts and they 'work the trade' on the investment teams' behalf. This process also avoids duplication of information and communication, while achieving the 'best price' for the fund.

In terms of counterparty risk, Standard Life Investments is required to satisfy its Group Credit Risk policy which stipulates a minimum credit rating for counterparties. This limits potential permitted banks and counterparties. In today's environment this would perhaps have been more of an issue given rate downgrading across the sector.

Although it should be a relatively straightforward legal document, the ISDA in this case was almost a stumbling block for us. It was purely a timing issue as our Legal team was in the process of restructuring & renegotiating ISDA agreements with a range of banks. The renegotiating process took longer than both parties had anticipated.

A further issue for the trade was the requirement for the Fund to receive daily pricing on the contract under COLL rules. The trustees required to be satisfied that pricing models reflected reliable and verifiable daily valuations taking into account views of external parties.

Outcomes

Experience from the trade has allowed further understanding of the volatility of mark-to-market valuations. These values are subject to the same underlying impacts from sentiment as direct property values, albeit the low volume of potential counterparties increases the potential volatility along the life of the trade.

In terms of administration, our experience with this trade led us to begin the process of negotiating an ISDA with all potential funds and counterparties, rather than waiting until a potential trade arises.

Of course forecasts change; the Research team proved too bullish on the IPD French Office Index return for 2007. The forecast total return of 18.7% return exceeded the actual 18.2%. However, within the recent environment of heightened global financial uncertainty, risk aversion and a collapse in credit, the swap looks likely to deliver what was required – French office market unleveraged returns and a diversification benefit to a global property fund.

Anne Breen,
Standard Life Investments