

# FTSE Indices for Property Derivatives

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## ABOUT FTSE GROUP

**FTSE Group (FTSE) is a world-leader in the creation and management of indices.** With offices in Beijing, London, Frankfurt, Hong Kong, Boston, Shanghai, Madrid, Paris, New York, San Francisco, Sydney and Tokyo, FTSE Group services clients in 77 countries worldwide. It calculates and manages the **FTSE Global Equity Index series**, which includes world-recognised indices ranging from the FTSE All-World Index to the FTSE4Good Index Series and the FTSEurofirst Index Series, as well as domestic indices such as the prestigious FTSE 100 Index. FTSE also calculates a range of fixed income, alternative asset class, responsible investment and investment strategy indices.

The company has **collaborative arrangements** with the ATHEX, Cyprus, NYSE Euronext, Johannesburg, London, Madrid, Malaysia, NASDAQ, Singapore and Taiwan exchanges, as well as organisations such as APCIMS, EIRIS, EPRA, NAREIT, Nomura Securities, and Xinhua Finance of China. FTSE also has a collaborative agreement with Dow Jones Indexes and has developed a single sector classification system for global investors, the **Industry Classification Benchmark (ICB)**.

FTSE indices are **used extensively by investors worldwide** for investment analysis, performance measurement, asset allocation, portfolio hedging and for creating a wide range of index tracking funds, Exchange Traded Funds, structured products and derivatives. Independent committees of senior fund managers, derivatives experts, actuaries and other experienced practitioners review and approve all changes to the indices to ensure that they are managed objectively and without bias.

## FTSE COMMERCIAL PROPERTY DERIVATIVES

### What is commercial property?

Commercial property can be defined as investable, institutional grade assets such as office buildings, shopping centres, and industrial spaces. Returns of commercial property are based on a combination of capital appreciation (or depreciation) and rental income.

### What are commercial property derivatives?

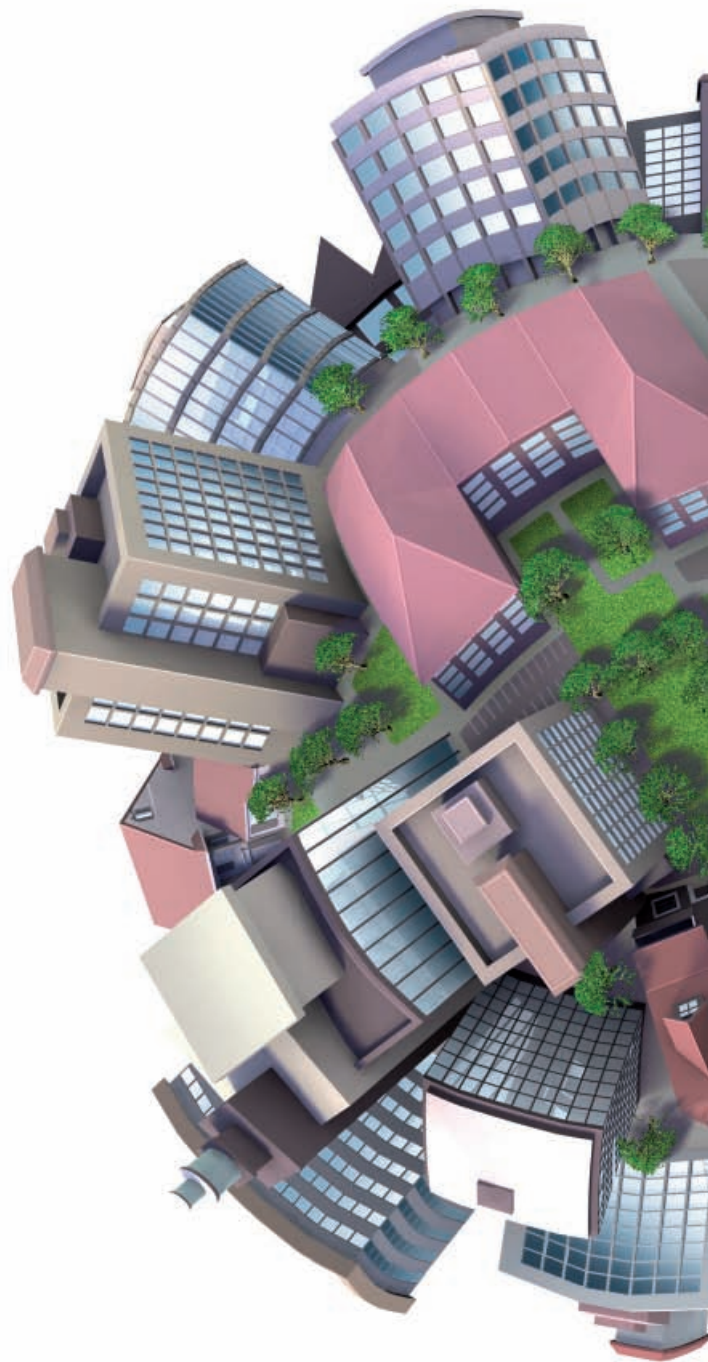
A derivative is a financial instrument whose value is dependent on (or derived from) the value of another asset, i.e. an underlying security or index. As such, commercial property derivatives are financial instruments that derive their value from underlying commercial property.

### Who uses derivatives?

**Hedgers:** Property investors who use derivatives to hedge an exposure created by a position in some non-derivative instrument to reduce their portfolio risk or to meet liquidity requirements<sup>1</sup>. They include large institutions (life & pension), banks, fund managers, and property companies.

**Speculators:** Investors who search for profit potential by buying and short selling products linked to – in this instance – commercial real estate. They include hedge funds and high-net-worth individuals.

**Arbitrageurs:** A type of investor who searches for pricing inefficiencies in the capital markets and attempts to profit from them. Investment banks and hedge funds are more likely to take this position by buying at lower and selling at higher prices.

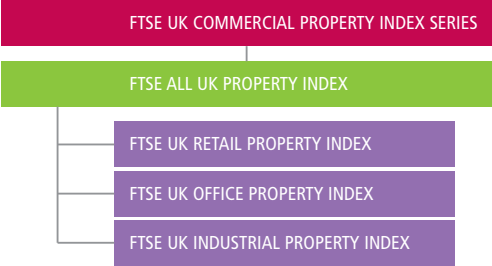


<sup>1</sup> The need of an individual or institution to find counterparties to transact or receive cash for their obligations

# FTSE UK COMMERCIAL PROPERTY INDEX SERIES

## Index structure

FTSE Group launched the FTSE UK Commercial Property Index Series, a new set of indices for the UK commercial property market in 2006. The index series provides investors with a definitive daily measure of the performance of investable, institutional grade commercial property<sup>2</sup> split by market sector. Headlined by the FTSE All UK Property Index, three additional sector indices give investors access to performance data in retail, office and industrial sectors of the UK commercial property market on a daily basis for the first time.



The index series also provides a platform for a new generation of commercial property derivatives, giving investors a more diversified and liquid alternative to investing directly in property with its risk-reward and low volatility payoff<sup>3</sup>. The differentiation factor is that the index series only provides a measure of the return of the underlying real estate, and not that of equities, REITs or any other property-related assets.

## Sub-sector weightings

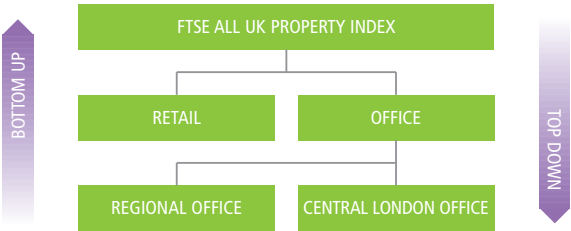
Sub-sector target weights are taken from the FTSE Commercial Property database and other appropriate industry sources to provide a good representation of investable commercial property. The FTSE UK Commercial Property Index Series is reviewed annually in March using data taken as at the last business day in December. All decisions are taken following advice from the FTSE Property Advisory Group (FTSE PAG)<sup>4</sup> in respect of FTSE’s proposals for the composition of the index series. Following this analysis and consultation, the annual target weights are released in March for implementation by June each year<sup>5</sup>.

## FTSEpx fund

The FTSEpx fund is a open-ended property unit trust domiciled and regulated in Guernsey, set up to provide the performance data for the index series. The fund is managed by MSS UK Property Index Fund Management Limited and advised by MSS Real Estate LLP and Invista Real Estate Investment Management in the UK. FTSE has licensed MSS UK Property Index Fund Management Limited to create the FTSEpx fund. Further details are available at [www.msscapi.com/realestate.aspx](http://www.msscapi.com/realestate.aspx).

## FTSE investment process

The FTSE UK Commercial Property Index Series ground rules<sup>6</sup> are adhered to by FTSEpx fund. The target weights set each year by FTSE govern the top-down or passive component to the allocation of assets between retail, office and industrial properties. Within the confines of the FTSE ground rules and the target weightings, the additional specific asset selection process is undertaken by the fund’s property advisers and the investment committee. This is the active or bottom-up element of the investment process.



<sup>2</sup> Refer to Appendix A for a comparative total return performance. <sup>3</sup> Refer to Appendix B. <sup>4</sup> The FTSE Property Advisory Group (FTSE PAG) is responsible for maintaining and evolving the Rules for the Management of the Commercial Property Index Series. PAG’s members are independent and authoritative individuals from the commercial property community. <sup>5</sup> Refer to Appendix C for the latest sub-sector weightings. <sup>6</sup> Visit [www.ftse.com/ukcommercialproperty](http://www.ftse.com/ukcommercialproperty) to download the index ground rules.

## SWAPS

### What are swaps?

A swap contract is an agreement to exchange future cash flows, where typically one cash flow is based on a variable price and the other on a fixed one. In this case, one party makes payments based on a set rate – either fixed or variable – while the other party makes payments based on the return of an underlying asset, which includes both the income it generates and any capital gains. In the case of a commercial property swap, the asset owner transfers their exposure to systematic<sup>7</sup> risk by exchanging it for a floating-rate interest payment, at a premium or discount over a reference market rate, e.g. LIBOR.

The total return<sup>8</sup> investor gains exposure to the FTSE All UK Property Index for a specified period of time, without owning the underlying properties, and with an agreed notional exposure but no principal exchange at the outset or at maturity. If the index falls over the life of the swap, the total return investor will be required to pay the amount by which the index has fallen.

### Who might invest in swaps?

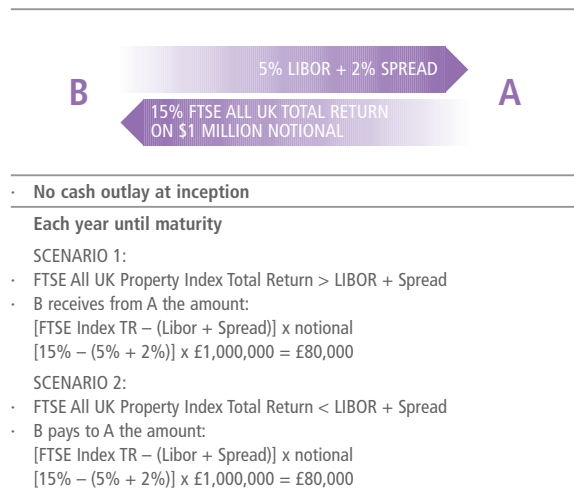
As the most popular derivatives instrument to date, swaps are used for a variety of purposes: hedging<sup>9</sup>, increasing or decreasing exposure to commercial real estate, and trading alpha<sup>10</sup> and beta<sup>11</sup>. Property companies as well as large institutions (life & pension), fund managers and hedge funds take advantage of this instrument in order to achieve their investment objectives.

### How do swaps work?

The following considers a total return swap on FTSE All UK Property Index.

Two parties enter into a one-year £1,000,000 notional total return swap where Party A sells a FTSE index swap (sells the FTSE) and receives LIBOR + fixed margin (say 2%) and Party B buys the FTSE index swap (buys the FTSE) and receives the total return of the FTSE All UK Property Index and pays LIBOR + final margin (2%). If LIBOR is 5% and the FTSE All UK Property Index appreciates by 15%, Party A will pay Party B 15% and will receive 7%. The payment will be netted at the end of the swap with Party B receiving a payment of £80,000 (£1 million x 15% – 7%).

**Figure 1**  
FTSE All UK Property Index (TR) swap structure



<sup>7</sup> Systematic risk: The undiversifiable market risk associated to direct investment in the underlying, commercial property in this case. <sup>8</sup> Capital plus income return.

<sup>9</sup> The practice of offsetting any risks by taking an equal but opposite position and in the derivatives market. <sup>10</sup> Alpha: The excess return over the generic market return.

<sup>11</sup> Beta: The generic market return.

### How can a property portfolio be hedged using swaps?

If a property-holding firm expects the market to slow down and would like to avoid selling its property, it can hedge this risk by taking a short position on FTSE All UK Property Index (TR). In essence, by selling the FTSE returns to the swap dealer, the firm is locking in a fixed rate of LIBOR + a given spread in preference to becoming exposed to the movements in the property market.

**Figure 2**  
Hedging property using the FTSE All UK Property Index (TR)



### How to increase exposure to commercial property using swaps?

An investor looking to diversify a stock market portfolio by investing in commercial property but lacking sufficient capital or know how to do so, could take a long position on the FTSE UK Commercial Property Index.

**Figure 3**  
Gaining exposure to property with the FTSE All UK Property Index (TR)



In order to then decrease any exposure to commercial property, the investor has three choices:

- Make the opposite trade by selling the index against the receipt of LIBOR + spread
- Unwind the existing swap with the counterparty
- Sell the exposure to commercial property to a third party

### What are the risks associated with FTSE Property Index swaps?

**Basis risk:** Defined as the difference in investment performance between the investor's portfolio on the one hand, and the portfolio in the FTSE index on the other.

**Counterparty risk:** Defined as the risk that the other party to a transaction will fail to fulfill its obligations and default. Counterparty risk rises with an increase in outstanding payment liability. However, as typical FTSE swap counterparties tend to be large AA-rated banks, counterparty risk is more likely to be of concern to the issuing bank, rather than the end investor.

**Mark-to-market risk:** Defined as the risk that fluctuations in underlying markets may change the mark-to-market value of the contract – sometimes significantly – before it reaches maturity. The mark-to-market value is determined by a 'fair value' assessment of unwinding the derivative contract at the time of assessment, instead of holding to maturity. The mark-to-market valuation may be positive or negative, but in either case the change in value is carried through to the investor's profit and loss account. In the case of property derivatives contracts written using 'database' indices that cannot be hedged, the fair value assessment is deduced from up-to-date published property derivatives pricing, which can be very volatile.

Derivatives based on the FTSE UK Commercial Property Index Series are priced on the cost of LIBOR plus the cost of hedging using the fund, which is in turn priced daily based on its NAV. This means that these derivatives can be easily hedged and the hedging easily unwound at a transparent price at any time. Therefore the mark-to-market is not dependent on pricing sentiment, but on published prices in a similar way to FTSE 100 equities derivatives. Therefore, FTSE property swap prices are very stable, and affected mainly by changes in LIBOR.

## IN-SPECIE SWAPS ('PROPERTY REPOS')

### What are in-specie swaps?

In-specie swaps involve the physical exchange of property assets between a fund and the derivative investor who would necessarily hold these property assets to begin with. In return for selling its property assets to the fund, the investor receives fund units to the same value (after costs).

The investor may then convert these units into a derivative, selling them to the derivative provider as its hedging requirements dictate. This is subject to the suitability of the property assets for investment by the fund, as determined through due diligence.

### Who might invest in an in-specie swap?

Property investment funds that need to:

- Create liquidity to meet immediate redemptions whilst purchasers are sourced for their assets or,
- Offload exposure to commercial property in the short-term but re-gain it in the long-term without suffering high transaction costs while also creating 'immediate' liquidity.

### How do they work?

The following example is based on the assumption of total return swaps exchanged at one fund unit to each Property Unit Trusts (PUT) unit.

Figure 4  
Fund units in-specie swap



Having transferred PUT units into a fund, the fund manager has achieved two things:

- Diversified a specific risk from an investment concentrated into a single PUT, to the diversified underlying portfolio held by the fund.
- Newly issued units provide the basis for the fund manager to create property derivatives on the FTSE UK Commercial Property Index Series with a bank.



## FORWARD CONTRACTS

### What are forward contracts?

A forward contract is an agreement to buy something at a specified price on a specified future date. In this case, the investor agrees to buy a FTSE UK Commercial Property Index Series 'forward' at a fixed price on a specified date.

The forward price is based on the bank's cost of investing in and holding units for the duration of the contract, plus an appropriate margin for the bank's risk and balance sheet usage. Typically, the forward contract would be 'cash settled' by the investor receiving the cash difference between the level of the index and the cost of the forward on the maturity date. Alternatively, it could be settled by the investor buying the units from the providing bank at the value published on the maturity date.

### Who might invest in a forward?

Forward contracts are instruments that allow the investor to gain exposure to commercial property through the index with the advantage of not requiring to invest capital up-front.

The investor may be required to make a deposit with the bank as initial margin<sup>12</sup>, with further deposits required for a variation margin<sup>13</sup> contract, in order to meet the bank's credit/counterparty risk criteria.

### How do they work?

An investor wishes to buy £10m exposure to the FTSE UK Commercial Property Index Series 'forward' in five years. The bank's quoted price is 132%. On entering into the contract, the bank borrows £10m on to its balance sheet, buys £10m of units in the fund and holds them on its trading book for five years. On maturity, the bank redeems those units with the fund for cash and pays the investor the difference as follows:

Market requirements	
FTSE Property Total Return Index at start:	100.00 (rebased)
FTSE Property Total Return Index at maturity:	141.18
FTSE Property Total Return Index increase:	41.18
STG 5 year fixed rate zero coupon interest:	5.25% per annum
Bank's margin:	0.50% per annum
Five year compound cost:	$= ((1+0.0525+0.005)^5) = 132.25\%$
Cash Settlement:	$= (41.18\%-32.25\%) \times £10m = £8.93m$ profit

If the investor believes that total returns from commercial property will out-perform an average rate of 5.75% per annum, then the forward contract appears to be a profitable investment.

### What are the risks associated with a forward contract?

The main risk associated with the forward contract is with the performance of the index falling below the implied annual cost of the forward. This may then require the investor to pay variation margin to the bank during the term of the forward to minimise the bank's counterparty risk. As a stand-alone derivative, the forward represents a 'long-only' investment in commercial property and as with a simple investment into the fund, there is no protection for the investor against falling performance and negative returns.

For the bank providing the forward, its main concern is counterparty risk arising from the credit quality of the investor. This may be resolved by the bank taking various credit enhancements, such as initial and variation margin commitments, to give it protection in the event that the index under performs the LIBOR cost component of the forward structure.

<sup>12</sup> The amount a market participant must deposit into her margin account for mark-to-market purposes. Also known as original margin. <sup>13</sup> During periods of great market volatility or in the case of high-risk accounts, additional amount required by the bank for mark-to-market purposes.

## OPTIONS

### What are options?

An option contract grants its holder the right, but not the obligation, to buy or sell something at a specified price, on or before a specified future date. There are two basic types of options:

- **Call option**
- **Put option**

These can be either long (buying the option) or short (selling the option), and the basic concepts are:

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**Long Call Option:** The investor that is long a call option pays a premium and acquires the right to **buy** a sector of FTSE All UK Property Index at a specified strike price and maturity. It indicates a bullish<sup>14</sup> sentiment towards the commercial property market. At maturity, the investor makes a profit when the index finishes above the strike price. Other than the initial option premium payout, the investor bears no further losses.

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**Long Put Option:** The investor that is long a put option pays a premium and acquires the right to **sell** a sector of FTSE All UK Property Index at a specified strike price and maturity. It indicates a bearish<sup>15</sup> sentiment towards the commercial property market and it is used as a protection against falling prices. At maturity, the investor makes a profit when the index finishes below the strike price. Other than the initial option premium, the investor faces no further losses.

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**Short Call Option:** The investor that is short a call option receives a premium from the long investor in order to commit to the obligation to deliver the sector of FTSE All UK Property Index at a specified strike price and maturity should the index finish above the strike price. It indicates a **bearish** sentiment towards the commercial property market as the short-investor expects the index to fall.

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**Short Put Option:** The investor that is short a put option receives a premium from the long investor in order to commit to the obligation to buy the sector of FTSE All UK Property Index at a specified strike price and maturity should the index finish below the strike price. It indicates a **bullish** sentiment towards the commercial property market as the short investor expects the index to rise.

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### Who might invest in options?

FTSE All UK Property Index options are important derivative tools used for the creation of retail structured products. Investments banks writing structured notes<sup>16</sup> linked to FTSE All UK Property Index make use of them in order to deliver the positive return of the index to investors.

### What are the risks associated with options?

As with any long option investment, the risks lie in the value of the long option reducing to zero and the loss faced by the investor being the whole of the option premium.

The risks of the short options are significantly greater as the investor has the obligation to buy/sell the underlying assets at a fixed price and date in the future. The risk is that, come the option's expiration date, the market's movements might have created losses in excess of any option premiums received.

<sup>14</sup> Bullish: Optimistic position expecting the index to rise. <sup>15</sup> Bearish: The opposite of bullish, meaning a pessimistic position and an expectation that the index will fall. <sup>16</sup> Structured Notes: Similar investment to fixed income bond bearing less risk (due to the frequent capital protection component of such bonds, if held until maturity) than investing directly in the index.

# STRUCTURED PRODUCTS

## What are structured products?

Structured products provide a pre-determined return at one or more future dates linked to one or more underlying financial prices, rates or indices. A key feature is that they can either be broken down into a number of separate financial instruments one of which is a derivative product, or they use derivative technology to provide the investment return. By default, this excludes warrants, listed options and futures, and Exchange Traded Funds. In this instance, the underlying index is the FTSE All UK Property Index.

## Who might invest in structured products?

Structured Products are widely sold to private retail investors via banks and building societies, IFAs and private banks.

They are used to meet a wide variety of investment needs from short-term savings to longer-term, tax efficient investing for pension or other personal financial planning. A typical structured product might be similar to a fixed-income bond and for example could be linked to the returns from the FTSE All UK Property Index.

For credit reasons structured products usually require full investment at the outset.

There are a variety of possible structured products that can be linked to the FTSE All UK Property Index including for example:

- Capital-protected notes structured using call options,
- Capital-protected notes with Constant Proportion Portfolio Insurance (CPPI),
- Index-linked bull and bear bonds, and
- Swap-linked notes.

## How do they work?

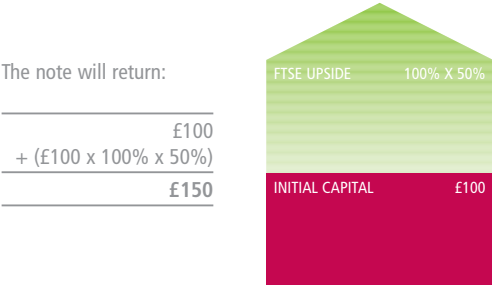
### Capital-Protected Notes structured using options

The following example describes a five-year capital protected note, with no risk to capital if the investment is held until maturity and 100% participation in the appreciation of the index.

**At initiation:** The structuring bank will invest part of the initial investment in a zero-coupon bond or any other risk-free asset, and the remainder in FTSE All UK Property Index Call Options. Assuming a hypothetical £100 initial investment, the allocation would be:



At maturity:  
Scenario 1 – FTSE All UK Property Index rises 50%



Scenario 2 – FTSE All UK Property Index is down 10%



In this case, the FTSE All UK Property Index Call Option expires without value and subsequent loss of the initial option premium. However over the life of the investment the zero-coupon bond has increased its cash value back to that of the initial amount invested, and is returned to the investor.

## CAPITAL-GUARANTEED BONDS VIA CPPI

### What is Constant Proportion Portfolio Insurance (CPPI)?

CPPI is a dynamic asset allocation technique whereby the assets are divided up over the period of the investment between safe assets (cash) and the FTSE UK Commercial Property Index without the extra cost associated with the purchase of the option. The capital protection can then be assured and geared returns achieved. See right for bullish and bearish scenarios.

### Who might invest in CPPI products?

Another form of capital guaranteed product, it is widely sold to private retail investors who would like to participate in the upside of the commercial property returns without the risk of capital depreciation.

### How does CPPI work?

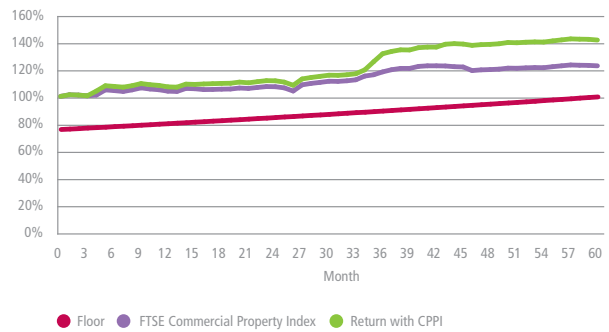
The amount dynamically allocated to the fund is positively related to the FTSE All UK Property Index performance, meaning that as the index goes up, the full amount of the investment is allocated to the FTSE All UK Property Index; if the index starts to fall, increasing amounts of the underlying index are sold and reinvested into cash.

As the FTSE All UK Property Index shows very low volatility of 2.8% per annum<sup>17</sup>, CPPI techniques work very well as low volatility<sup>18</sup> diminishes the friction costs of continuous re-allocation of investments between cash and the index, thereby increasing the returns to the investors.

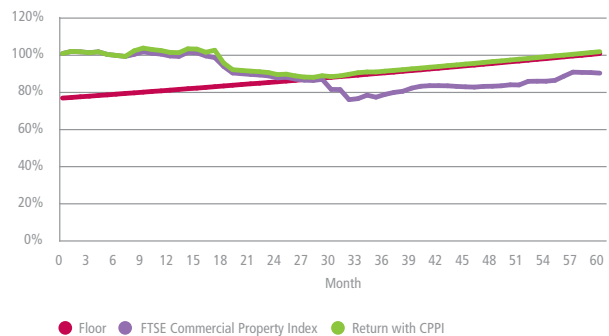
Initially 100% of proceeds are exposed to the FTSE All UK Property Index. In the event of negative returns, some portion of that capital is transferred back from the index and is assigned to cash. If the index subsequently rises, the investment is moved back from cash into the index.

A CPPI product typically has a stated 'floor'. If the FTSE All UK Property Index falls below that floor, then all the money is reversed into cash for the balance of the term. This is called a "knock-out" scenario and the investor ends up holding cash until maturity.

CPPI RETURN – THE BULLISH CASE



CPPI RETURN – THE BEARISH CASE



<sup>17</sup> Source: FTSE Group, as of 31 January 2008, based on annualised daily changes of return. <sup>18</sup> A measure of the change in price over a given period. It is often expressed as a percentage and computed as the annualised standard deviation of percentage change in price.

# INDEX-LINKED BULL AND BEAR BONDS

## What is an index-linked bond?

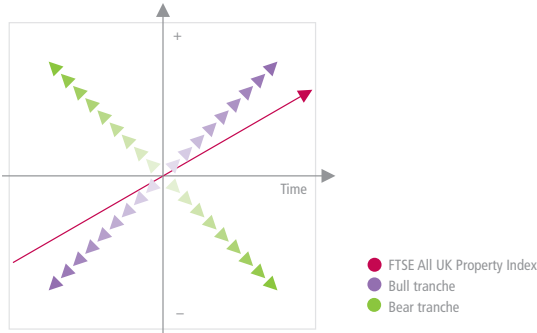
An index-linked bond can provide investors with similar returns as investing directly in the commercial property market. The bull and bear structures refer to the fact that the principal value of the bull tranche increases with a rise in the value of the FTSE All UK Property Index, whereas the principal value of the bear tranche decreases as the value of the index increases.

Consequently, an investor taking a long view on commercial property, would in almost all probability buy a bull bond. Conversely, an investor taking a short view of the market would buy a bear bond instead.

## How do they work?

The hypothetical structure below shows geared bull and bear bonds tranches without a capital guarantee feature.

**Graph:** Bull and bear tranches pay-offs assuming participation higher than 100% in the index.



Assuming a £10m initial investment and a hypothetical 130% participation on either the fall or rise of the FTSE All UK Property Index, the investment profit for the bull and bear tranches would be as shown on Tables 1 and 2.

## What are the risks associated with bull and bear bonds?

These bonds show the same risk profile as investing directly in commercial property and may suffer from capital depreciation.

**Table 1** Bull and bear tranches profits compared

Final index level compared to initial level (%)	Participation	Bull bonds profit	Bear bonds profit
+60	130	+7.80	-7.80
30	130	+3.90	-3.90
0	130	0	0
-60	130	-7.80	+7.80

As this illustrative bond is not capital guaranteed, the return received by the investor at the end of the investment would be the initial outlay plus or minus the pay-off derived from the final index level.

**Table 2** Bull and bear tranches maturity values of initial £10m investment

Final index level compared to initial level (%)	Bull bonds profit	Bear bonds profit
+60	+17.80	+2.20
30	+13.90	+6.10
0	0	0
-30	+6.10	+13.90
-60	+2.20	+17.80

**SWAP-LINKED NOTES**

**What are swap-linked notes?**

These notes are a combination of a floating-rate (LIBOR) bond and a swap agreement. The return is linked to the FTSE Commercial Property Index and LIBOR.

**How do they work?**

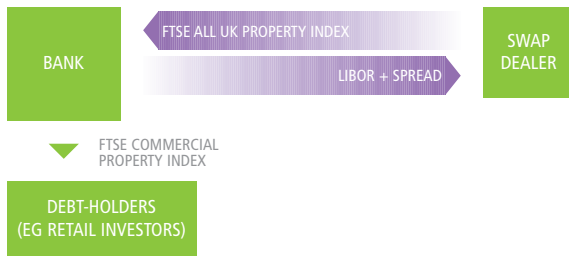
If a bank issues notes pegged to the FTSE All UK Property Index but it is concerned that the index will rise in the future whilst LIBOR will go down, the bank can then enter into a swap agreement in order to link the debt to LIBOR.

**What are the risks associated with swap-linked notes?**

In general, structured notes are used to address an institution’s risk exposure, and are normally used for hedging portfolio risks.

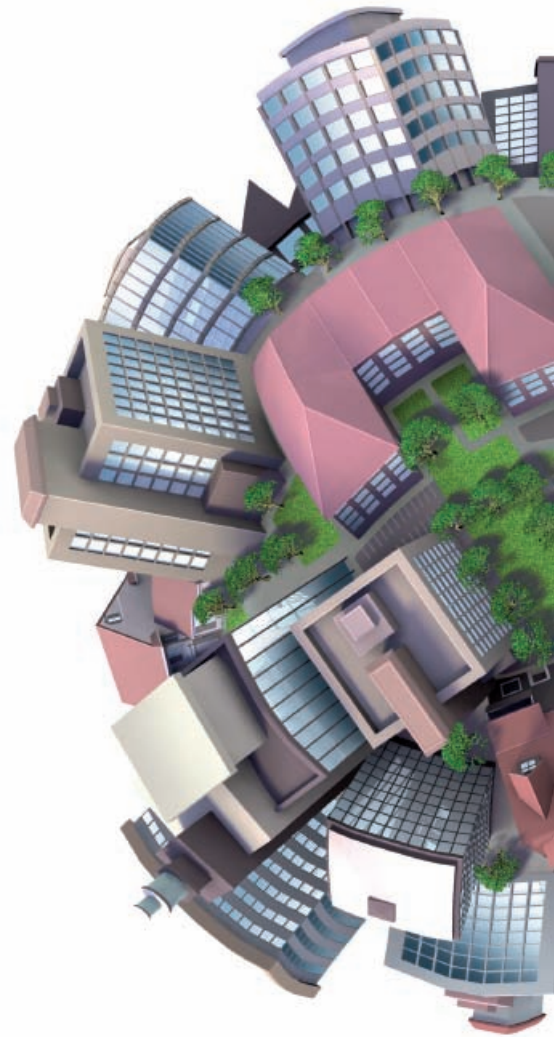
For retail investors, the characteristics of guaranteeing the initial investment reduce the risk of capital loss and gear the exposure in the upside. However as some structures provide customized features and embedded options, they may be difficult to price and can reduce liquidity. Consequently, investors should ensure compatibility with their investment strategy and time horizons.

**Figure 5**  
Swap-linked note structure, synthetic LIBOR debt



However, if a bank issues notes pegged to LIBOR and is concerned that LIBOR will rise while commercial property will go down, the bank can then enter in to a swap agreement (to hedge out its LIBOR exposure) in order to link the note outflow to the FTSE All UK Property Index.

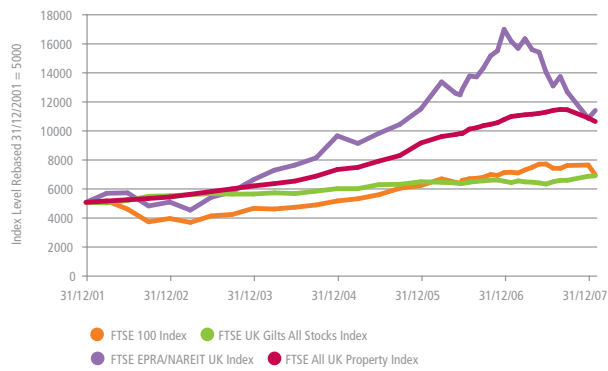
**Figure 6**  
Swap-linked note structure, synthetic FTSE All UK Property Index debt



## APPENDICES

### Appendix A FTSE All UK Commercial Property Index Performance

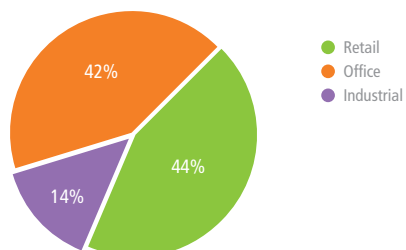
Long-term comparative performance to 31 January 2008



### Appendix B Risk Return Analysis (as at 31 January 2008)



### Appendix C FTSE All UK Commercial Property Index Weightings (as at 31 January 2008)



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