



Investment
Property Forum

The background of the slide is a photograph of a modern glass skyscraper. A thick red line graph is overlaid on the image, starting from the bottom left, dipping, then rising sharply to the top right, ending in an arrowhead. The graph is set against a dark blue background that covers the top and bottom of the slide.

Trading Property Derivatives

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Introduction

The **Trading Property Derivatives** handbook picks up where **Getting into Property Derivatives**, published by the IPF Property Derivatives Interest Group (PDIG) in November 2008, left off. The earlier publication sought to tackle some of the hurdles encountered by many property investors wanting to participate in the property derivatives market. A recently updated edition of **Getting into Property Derivatives** can found on the IPF website www.ipf.org.uk.

This new handbook takes the reader one step further and aims to provide more practical tips and advice on how to tackle the issues involved in getting an organisation to the stage where it can trade derivatives routinely. The content within **Trading Property Derivatives** is from a UK-based perspective, although many areas of discussion will also be relevant for other markets. Readers should also note that many of the property derivatives based on non-UK indices have actually been traded in the London financial market. Commentary regarding tax and regulatory issues will be less relevant for non-UK readers and further advice will need to be sought.

The content of this handbook broadly follows the structure of the flowchart on pages 4 and 5.

I should like to thank all the members of the IPF PDIG Technical Sub-Group, for their invaluable help and time in writing this first edition of **Trading Property Derivatives**. My thanks also go to Nick Blakemore of PRUPIM, Phil Nicklin of Deloitte and Mark Daley for their respective contributions. The intention is to review this publication on a regular basis and the Technical Sub-Group would welcome any suggestions on content for future editions.

Will Robson

Chair of the IPF Property Derivatives Interest Group (IPF PDIG) Technical Sub-Group
Director, Property Derivatives, PRUPIM

PDIG Technical Sub-Group members

Anne Breen, Standard Life Investments
Kelly Cleveland, Grosvenor Group Limited
Stewart Cowe,
Scottish Widows Investment Partnership
Louise Ellison, IPF
Sue Forster, IPF
Mark Long,
Invista Real Estate Investment Management

Jeremy Marsh,
Invista Real Estate Investment Management
Kate Pedersen, IPD
David Prescott, Aviva Investors
Iain Reid, Protego Real Estate Investors
Angela Sheahan, Consultant
Tony Yu, ING Real Estate

About the IPF

Background

The Investment Property Forum (IPF) is one of the leading specialist property industry bodies in the UK. It comprises a network of influential professionals, all active in the property investment market.

The strength of the organisation lies in its 1,800 members, who include investment agents, fund managers, bankers, lawyers, researchers, academics, actuaries and other related professionals.

Our Mission

The IPF's mission is to improve the awareness, understanding and efficiency of property as an investment for its members and other interested parties, including government, by:

- Undertaking research and special projects;
- Providing education; and
- Encouraging discussion and debate.

Our Focus

- To improve the awareness of the investment characteristics of property;
- To encourage innovation and best practice in the property investment market;
- To support initiatives that enhance liquidity and efficiency of property as an investment class; and
- To promote quality, excellence and responsible investment practice.

Join the IPF

Membership of the Forum is dependent upon experience and the contribution that individuals can make to the organisation. As a guide, we normally expect a minimum of five years' professional experience, with at least two in property investment and/or finance.

For further information about the IPF and how to become a member, please contact Sue Forster, Executive Director, email: sforster@ipf.org.uk or visit www.ipf.org.uk.

About PDIG

Property Derivatives Interest Group (PDIG)

Derivatives are long established and widely used in the securities market, but their use for property is still limited. The Property Derivatives Interest Group (PDIG) was set up by the IPF to support the development of the property derivatives market, partly in response to the needs of investors and partly following changes to the regulatory and tax environment, which have made property derivatives more accessible and more attractive.

PDIG Technical Sub-Group

Towards the end of 2007, the PDIG Steering Committee decided to establish a dedicated Technical Sub-Group to support the development of a deep and liquid market in property derivatives by giving guidance to the property investment management community on the various ways in which the use of property derivatives affect the management of property portfolios.

Much of the Sub-Group's initial discussions concentrated on looking at why property investors, and specifically managers of actual property portfolios, have not been as active in the market as one would have expected or hoped. The answer to this question is complex but it is widely accepted that a significant hurdle to property investors is one of lack of understanding, both at an operational and practical level.

In November 2008, the IPF and the PDIG Technical Sub-Group published **Getting into Property Derivatives**, produced with the specific aim of addressing this problem by providing a practical, operationally-focused introduction to the use of property derivatives.

Trading Property Derivatives aims to take readers one step further by describing the issues encountered in trading property derivatives in more detail.

Join PDIG

PDIG organises a number of seminars and other events throughout the year. To find out more about the Group and how to become a member, please go to the PDIG website www.propertyderivatives.co.uk or the PDIG pages of the IPF website www.ipf.org.uk.

Contents

Swaps, structured notes or futures?	2
Trading property derivatives – implementation	4
I Approvals	6
II Analysis	14
III Execution	23
IV After trade systems	33
IPD Performance measurement methodology	42

Swaps, structured notes or futures?

Access to the property derivatives market can now be achieved in one of three ways; over the counter (OTC) swaps and options, structured notes and property index futures via the Eurex exchange. Each of these alternatives differs in terms of structure and their risk and return dynamics, as outlined in the earlier IPF PDIG publication, **Getting into Property Derivatives**. The variations in these characteristics have important operational, approval and compliance implications. This means that the choice of instrument will be driven largely by the nature of the entity intending to use them and the reasons for their use.

Although structured notes are less demanding in terms of the approvals and operational requirements, swaps are the dominant instruments in the current market. Consequently, this publication focuses on swaps, but also highlights any areas where choosing structured notes or futures would have different implications. Some of the issues surrounding this decision are set out below.

Structures characteristics			
	Swaps	Futures	Structured notes
Principal exchange	None	Initial margin	100% notional
ISDA documentation	Required	None required	None required

Swaps

Because swaps are unfunded instruments, with no notional exchanged upfront, the capital employed and exposure to the market are not the same, hence positions can be highly geared. This is worrying for regulators and therefore the use of swaps is tightly controlled, especially in funds that are marketed to non-sophisticated investors. The fact that swap contracts are unfunded means that collateralisation procedures are necessary to mitigate counterparty credit risk. This has various implications for back office functionality. The regulatory hurdles are therefore higher for swaps than for structured notes, which are often treated like bonds in this context because they are fully funded.

The other major characteristic that affects whether swaps are the appropriate property derivative instrument is the OTC nature of the contract. The need for ISDA documentation and related credit agreements can present many funds with the most significant initial barrier to trading.

Structured notes

A structured note is a financial instrument that has returns based on the swaps market, with bond-like regular coupons and a redemption payment. The returns can be structured in any way as agreed between counterparties to meet the specific needs of an investor.

Due to the funded nature of structured notes, there is a stronger link between market exposure and capital employed. Often they are equal but it is possible to structure a note with a geared return. Because they resemble a bond, they avoid the high regulatory hurdles and the operational complications associated with swaps and futures – one of the main reasons that they are used.

However, they are not without disadvantages. Credit risk becomes a bigger issue due to the funded nature of the instrument. Both principal and coupons are exchanged and hence are at risk of issuer default. Also, structured notes can be less flexible as an investment, especially when it comes to shorting the market. While it is possible to structure bear notes to take advantage of market downturns, this is intuitively less attractive if one wants to hedge a portfolio because of the need for cash upfront.

Futures

Futures are similar to swaps in that they are essentially unfunded but they differ in a number of other ways. Futures are individual calendar year contracts giving exposure to a single year, rather than multiple years as is normally the case with swaps.

In addition, ISDA documentation and credit agreements are not needed because these are standardised contracts and traded on exchange. The counterparty to the trade is effectively the exchange itself and hence counterparty risk is mitigated by being spread across all market participants. To trade directly requires membership of the exchange but this is not usually necessary for end users as they can trade through a bank or broker using a give-up agreement. Collateralisation is still required in the form of initial margin and variation margins, in accordance with the strict rules laid down by the exchange.

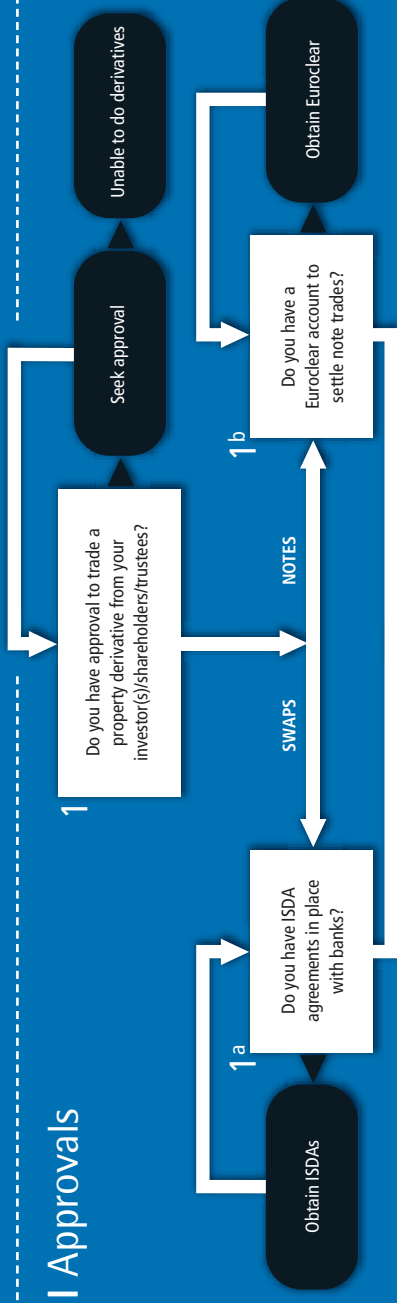
Give-up agreements

A give-up agreement is an arrangement where one party in a contractual relationship is replaced by another, with the latter assuming all rights and obligations of the former. Banks or brokers may offer this arrangement to their clients with regard to futures transactions on an exchange, where the client is allowed to trade with a counterparty in the name of the bank or broker. This might occur to enable the client to secure better conditions or market access.

Trading property derivatives – implementation

Stages

I Approvals



2

Do you have regulatory flexibility to trade a property derivative?

Unable to do derivatives

Seek FSA approval

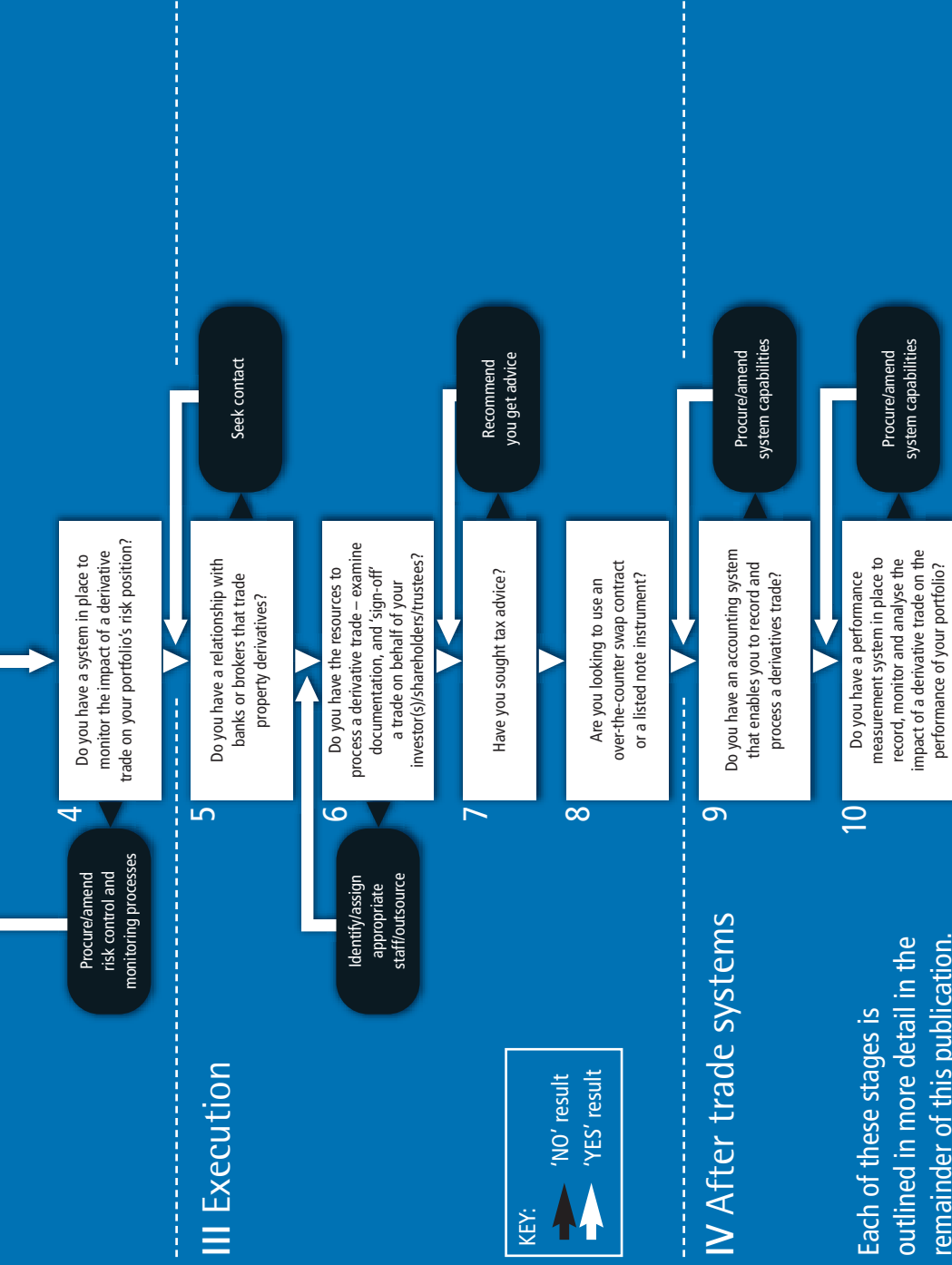
Approved

II Analysis

3

Do you have a system for analysing the implications of a derivative trade on your portfolios return and cash flow requirements?

Procure/amend system capabilities



Each of these stages is outlined in more detail in the remainder of this publication.

I Approvals

Depending on the type of entity for which the approvals are being sought, getting the necessary approvals to trade derivatives can be a lengthy and involved process.

The approvals generally required are:

- (1) Client approval
- (2) Regulatory approval

The following section makes the distinction between fund management houses and corporates, highlighting the particular areas of concern to each. The fundamental difference is that the fund management house is not usually the legal owner of the assets it manages. Regulation often becomes an issue in a principal-agent relationship and trading property derivatives is no exception. Furthermore, if funds are structured as separate legal entities, they may each require separate ISDA and CSA documentation.

ISDA documentation

The International Swaps and Derivatives Association (ISDA) is a trade organisation of participants in OTC derivative markets. Trades such as property total return swaps are executed with reference to ISDA standardised documentation.

Investors wishing to use total return swaps require two documents. The first is an 'ISDA master agreement' between the investor and a bank, which contains general terms and conditions such as provisions for the event of default or termination, but no details of any trade. The second document is the 'trade confirmation', setting out details of an actual trade e.g. the notional amount, the maturity date of the trade, the index upon which the trade is based etc., with references back to the respective ISDA master agreement for definitions and provisions.

Investors should be aware that agreeing terms and completing each ISDA master agreement can be a lengthy process, particularly as it is usually best practice to have ISDA master agreements with a number of banks in order to achieve competitive pricing consistently. Investors should take legal advice when negotiating ISDA master agreements with banks.

CSA documentation

A 'credit support annex' (CSA) is a legal document that regulates credit support (collateral) for derivative transactions. It defines the terms or rules under which collateral is posted or transferred between swap counterparties in order to mitigate the credit risk arising from 'in the money' derivative positions.

Fund management houses

(1) Client approval

When clients purchase fund management services they usually do so for specific asset classes or strategies. They want to be very clear as to what it is they are investing in and how their assets are going to be managed. This requires detailed documentation setting out what is expected of the fund manager in terms of what they can or cannot do.

This documentation may need to be changed to enable property derivatives trading. The issues outlined below should be considered when such a change is required.

NOTE:

The position is further complicated where the client and fund manager relationship is multilateral, rather than bilateral, meaning that the agreement is more difficult to achieve.

Fund prospectus

The fund prospectus is the contract between the fund provider/sponsor and the investor in cases where the fund is marketed openly to third party investors. It is essentially a full description of the fund characteristics, its aims and strategy, and includes details on its investment restrictions. Much of the detail, however, is related to legal structures and procedures.

If derivatives use is forbidden in the fund prospectus, this will require amendment through consultation with investors and their agreement by way of a vote. The fund manager will need to set out the case for derivatives, with reference to efficient portfolio management (EPM) and risk management. The various pros and cons of derivatives are set out in the publication, **Getting Into Property Derivatives**.

Investment management agreement (IMA)

In many cases, the fund provider and the fund manager are not the same entity and a separate contract, an investment management agreement (IMA), will exist between the two parties. An IMA will also exist in the case of segregated mandates, where the investor/fund manager relationship is bilateral. This document is generally less detailed than a fund prospectus because there is no requirement for details on unit pricing and trading etc. Instead, it focuses on the investment characteristics of the fund – its strategy and the instruments allowed within the investable universe.

Property IMAs often make no explicit mention of property derivatives. There is usually an allowance for a certain exposure to non-property assets that may allow property derivatives to be used. This is neither a green light nor a red light for their use and compliance teams should be consulted for interpretation.

If the IMA prohibits the use of property derivatives, this is not the end of the road. Since these documents, which are usually bilateral, are simpler and involve fewer parties than fund prospectuses, they are easier to amend. However, a good investment case for effecting such a change would still have to be made to the client. It may be possible to seek waivers to trade prohibited instruments as a short-term solution before more permanent changes to fund documentation can be made.

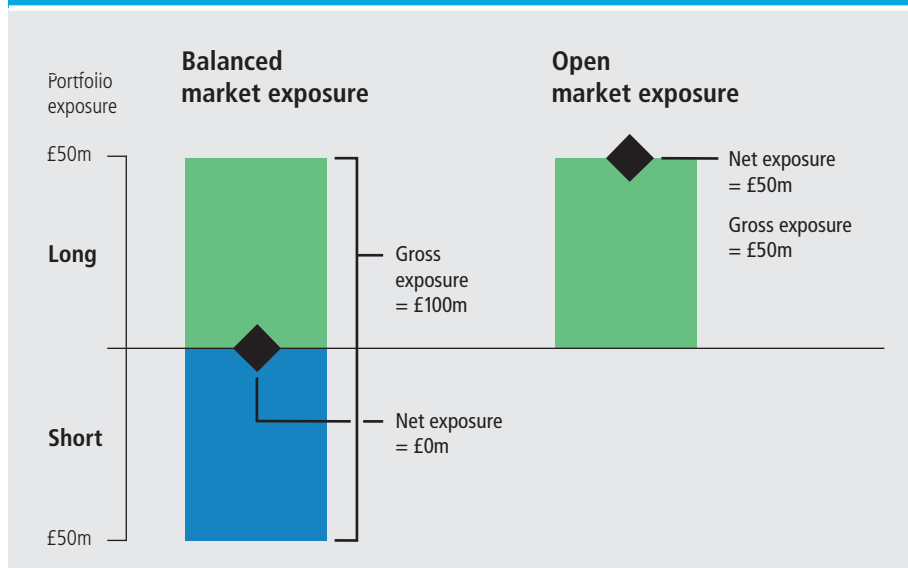
Exposure limits

Where documentation does allow exposure to derivatives (either explicitly or implicitly), this usually stipulates exposure limits as a risk control in order to avoid over-exposure to certain assets. In the case of derivatives, there is an important distinction between gross and net exposure limits. For most assets, gross and net exposure is the same. With swaps there is a difference (see **Figure 1**). If a fund had £50m of long contracts and £50m of short contracts on the same index, the net exposure to index risk would be zero but the gross exposure to property derivatives would be £100m. Gross limits can be restrictive for unfunded instruments because closing out contracts can be achieved by opening a new but opposing swap.

From an exposure management point of view, the simplest way to close out a contract is to cancel the contract with the counterparty directly. This can only be done with the agreement of the counterparty. In this instance, both net and gross exposure would fall to zero and counterparty credit risk is eliminated.

However, if closing the contract with the counterparty is not possible or is unattractive, the alternative would be to close out the position by entering into an offsetting contract. Assuming the fund had an open £50m long contract, this would be closed by entering into a £50m short contract with the same maturity. The net exposure would reduce from £50m to zero but increase the gross exposure to property derivatives to £100m, as well as increasing the counterparty credit risk. If a gross exposure limit prevented the fund from executing this trade, it would effectively increase risk by forcing the fund to hold an open market risk position, rather than helping to control risk as intended.

Figure 1 Gross and net exposure to derivatives



For investment risk, the important measure of exposure is net directional, while for counterparty credit and operational risk, the gross exposure is more relevant. Both should be considered and the appropriate risk controls addressing both risk controls adopted.

(2) Regulatory approval

The Financial Services Authority (FSA) takes a principles-based approach to regulation, which means that rules are, to an extent, often open to interpretation. This document is not designed to provide all the answers but rather highlight the issues that should be considered. Professional advice should be sought on how rules are to be interpreted for the specific circumstances of the fund in question.

The regulatory regime governing different types of funds is not uniform. Typically, the level of rigour in regulation is inversely related to the perceived sophistication of the funds' respective clients. This creates nuances in the rules applying to property derivatives in different fund types, as discussed below.

Regulatory regimes

The basic principles of admissibility apply to nearly all core mainstream funds – especially those sold to the public. Depending on the particular regime, they may be more detailed in their restrictions in terms of exposure limits or be more prescriptive on the interpretation of issues such as EPM. Detailed advice should be sought from compliance teams or legal counsel.

Set out below are the key principles relating to permitted investments. The terminology differs depending on the type of organisation, e.g. for life funds this is ‘admissibility’ and for unit-linked funds it is ‘permitted links’.

For life funds, assets must pass four tests to be considered admissible assets, allowing them to count towards capital adequacy ratios. Funds are allowed to hold a small percentage of inadmissible assets but many actuaries take a conservative approach and disallow any exposure to such assets. To be considered admissible, a property derivative contract must satisfy the following criteria:

- **Appropriate investment use** – the contract must be used for the purpose of efficient portfolio management (EPM) or the reduction of investment risk. This restriction exists to make sure that derivatives will be used more to manage risk and adjust market exposures quickly and efficiently, than for simply speculative purposes.
- **Cover** – this restriction exists to ensure that the necessary assets are in place to finance the liabilities that may be created as a result of entering into a contract. Therefore, a short derivative contract must be covered by a long position in assets that can be reasonably expected to produce the cashflows necessary to finance the floating leg of the swap. This will usually mean physical property but, to qualify as cover, the expected performance must be highly correlated to the subject index traded. In some cases, an offsetting long swap could be considered suitable cover.

With a long position, it is the fixed leg that may create liabilities that need to be funded, although negative performance on the subject index will create additional liabilities. Cover in this case will usually be cash. This requirement limits the potential for funds to gear derivative positions significantly because cover by definition reduces gearing.

For structured notes, the funded status of the instrument provides cover for long positions. There may be issues with bespoke notes that have gearing embedded into the structure, since the exposure to the market would be more than 100% of the cash behind the note.

- **Monthly valuation** – the asset must be capable of independent monthly valuation. A counterparty valuation should be verified under agreed sensitivity margins with an independent valuation. This can be done by an internal risk team at the fund management house or by a third party and involves collating other banks' prices to obtain an average to calculate the value.

The lack of published pricing information on individual sector and sub-sectors makes this task more difficult for contracts on these indices than for those based on the IPD UK All Property Index. Information is improving at the sector level but there is almost no published data at sub-sector level. It may be possible to agree valuation methodologies with risk supervisors, using the information that is available in the market in conjunction with modelling adjustments.

The same issues apply to structured notes due to their OTC nature. For futures, this issue is negated since, by design, in a liquid market, the exchange price upon which the position is valued is independent, prices are public and based upon tradeable prices. In the early stages of the Eurex property derivatives exchange, prices have been based on quotes from the OTC market.

- **Readily realisable** – liquidity is a factor to be considered in any investment. Exit liquidity is the main concern here, rather than the ability to transact in the first place. It must be possible to unwind the position 'within a couple of days' at a 'fair market price'.

Although liquidity is now considered strong enough in the IPD UK All Property swaps market at the £5m-£50m ticket size, pricing is more difficult for source at larger lot sizes and in the sector and sub-sector indices. This is a common feature of new and developing markets. For the less liquid contracts, additional clauses in contracts can be negotiated to document the counterparty's willingness to provide a fair unwind price at a future date. Although this can be helpful in allaying concerns in an admissibility context, the economic value of such guarantees is limited since there may be no way to prove or disprove a price quote as fair. These guarantees may be acceptable in the expectation of improving liquidity as the market develops. Under the current conditions, it is likely that funds will be limited to trading relatively short maturity contracts.

Approved persons and regulated entities

The execution of all derivatives transactions is a controlling function under FSA regulations and must be carried out by a FSA approved person. Only employees within a FSA regulated entity can have approved person status.

For firms that are not FSA regulated, but part of a larger group of companies, it may be possible to outsource the execution of derivatives contracts to the dealing desk at the regulated entity in the

group. It is also possible for employees within the property function to be seconded to the regulated entity for the purpose of obtaining FSA approved person status. Within such a group set-up, gaining FSA approved person status does not require a formal application to the FSA. Instead it is a matter for the FSA regulated entity to be satisfied that, were enquiries were made by the FSA, the approved person's competence to fulfil the role in question could be demonstrated.

For firms that are neither FSA regulated nor sit within a group of companies that has FSA regulated status, execution of derivatives contracts must be outsourced to a third party. The alternative is to purchase products that invest in derivatives.

It should be noted that structured notes are not considered derivatives in this respect and investment in these is permitted without approved person status.

EPM and its interpretation

Efficient portfolio management (EPM) is defined in the Financial Services Authority's (FSA) Handbook Glossary (www.fsahandbook.info) as being:

'techniques and instruments which relate to transferable securities and approved money-market instruments and which fulfil the following criteria:

- (a) they are economically appropriate in that they are realised in a cost effective way;**
- (b) they are entered into for one or more of the following specific aims:**
 - (i) reduction of risk;**
 - (ii) reduction of cost;**
 - (iii) generation of additional capital or income for the scheme with a risk level which is consistent with the risk profile of the scheme and the risk diversification rules laid down in the Collective Investment Schemes sourcebook (COLL).'**

Earlier definitions of EPM may apply to older funds.

These definitions of EPM can be more restrictive, especially in terms of defining EPM in the context of a tactical asset allocation (TAA) technique, suitable for use in the short term, namely three months. This period is derived from liquid markets, such as equities, where fund exposures are managed more dynamically and transaction are cheaper and less time consuming.

TAA in property operates on a much longer timescale but this is not necessarily accounted for within the regulations and may cause problems for some funds. The high transaction costs in property mean that property derivatives can usually satisfy EPM based on cost effectiveness. This is on the basis that they are not being used in a purely speculative way with high levels of gearing, but rather helping to execute portfolio strategies in a more efficient way than could be done using physical assets alone.

Property companies

The key differences between fund management houses and property companies in terms of the approval process are set out below.

(1) Client approval

The 'clients' are the company's shareholders, who effectively delegate decision-making authority (other than that reserved to shareholders) to the board of directors. The following factors must be considered in the approval process:

Board approval

A proposal would be taken to the board to commence trading in property derivatives. Whether this is a requirement depends upon the terms of reference of the board. If approval is not required specifically then this becomes a matter of judgment and will be influenced by the size of the intended programme.

Memorandum and articles of association

A proposal to change the memorandum and articles would need to be considered by the shareholders where property derivatives trading is contrary to a company's memorandum and articles of association. This is less of an issue now that companies' objectives can be so widely drawn.

Listing rules of the London Stock Exchange

Listing rule 10 governs significant transactions that are outside the ordinary course of a listed company's business. Whether trading derivatives is in the ordinary course of a company's business will depend on the size and incidence of similar transactions that the company has undertaken. Again, detailed advice should be sought from compliance teams or legal counsel.

(2) Regulatory approval

Property companies are not managing other people's investments and are therefore not subject to FSA or other regulatory requirements, although documentation (e.g. ISDA) and licensing requirements are the same as for funds. Note that there is potential for European Union proposed directives to bring property companies under a more stringent regulatory regime.

II Analysis

Organisations have different motivations for using property derivatives, determined by the type of investors on whose behalf they are investing, the range of different assets they hold and the circumstances in which they are operating. These considerations will lead to different ways of assessing fair value for a derivatives contract.

This section outlines the use of derivatives in different contexts and the principal issues to be considered in respect of each.

Reasons for using property derivatives

Hedging a portfolio

The ability to short property through a derivative contract allows managers to hedge beta risk in their portfolios. Hedging can be achieved by using All Property swaps to hedge general market risk on specific assets or a portfolio of assets. Sector (retail, office and industrial) or sub-sector swaps (e.g. shopping centres, retail warehouses etc.) could be sold to hedge out more specific market risks. As indices such as those produced by IPD are broken down further, managers could potentially sell swaps on specific regions and sectors (e.g. Scottish high street shops).

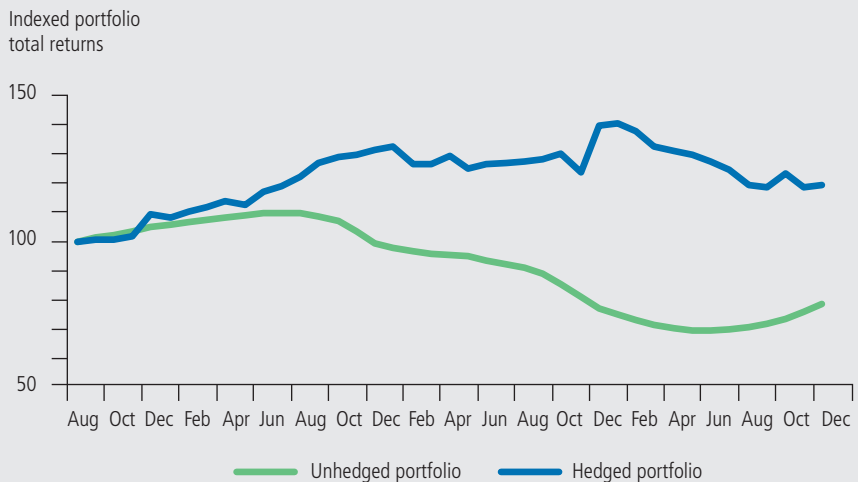
Pricing in property derivatives is driven by market sentiment. Managers can only hedge against market movements that are not already priced into the forward curve – making timing of key importance.

One can choose to hedge routinely or selectively. Routine hedging involves maintaining a constant hedging position throughout market conditions in case of an adverse price movement. Although this approach may lead to a drag on performance in bull markets (to the extent that it ensures hedges are put in place when market sentiment is positive) it provides the best possibility of gaining a hedge at an attractive price. Selective hedging is hedging the market for specific periods of time when the portfolio manager anticipates adverse price movements. Although this approach reduces drag on the portfolio in bull markets, the effectiveness of the hedge may be reduced due to missing the turning point in derivatives pricing. The choice of approach will impact on the relevance of each analysis consideration.

When considering a hedging strategy, the contract returns should be viewed within the wider portfolio. The derivative return should be combined with the expected performance of the particular portfolio. **Figure 2** shows a comparison of a fully-hedged portfolio and an unhedged portfolio during the 2007-08 downturn. The hedging strategy helped to insulate the portfolio from

the downturn in the property market because it was executed at the right time. However, had the strategy had been executed a year earlier, it would have caused the portfolio to underperform in 2006 since returns turned out to be greater than that implied by the derivatives market at the time. The important point is that the hedging strategy allows the portfolio returns to be smoothed out, rather than being subject to the full extent of swings in market movements.

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



Sources: PRUPIM, ICAP, CBRE/GFI, IPD

One of the major benefits of derivatives is that they allow a portfolio manager to employ short-term strategies that would not have been considered with physical transactions, due to high transaction costs and timescales. However, it is important to consider whether there is an alternative investment to the derivatives strategy. Where there is, the derivative strategy should be compared to both the 'do nothing' scenario and the alternative, making sure that the impact of relative differences in timescales and transaction costs are incorporated.

Investors should be aware of some of the risks associated with hedging using derivatives. For example, there is the 'basis risk' that the specific asset(s) being hedged do not perform in line with

the index. To an extent, this could be seen as an alpha opportunity, allowing good asset managers to hedge away market risks that they cannot control but keep the outperformance that they are able to generate.

Ideally, correlation analysis should be undertaken, comparing the physical asset(s) with the relevant index. However, it is often the case that time series for specific asset(s) are very short, depending on the hold period. In such cases, correlation data will be likely to prove unreliable.

Hedging development market risk

One of the largest risks arising in property development is that the market value of the developed building is different from that assumed in the development appraisal. This risk can be addressed through pre-sales in some cases, but derivatives provide an option to do this more swiftly and possibly at a better price. The same analysis considerations as above apply although basis risk may be a more significant consideration because the likelihood the performance of any one asset differing from that of the index is greater than for a portfolio of assets.

Liquidity management

One of the greatest challenges faced by managers of open-ended property funds over the last few years is that of liquidity management. Many unitised funds are priced daily and provide high levels of liquidity in the units of the fund. The underlying assets held in the fund are heavily dominated by physical property, which is much less liquid – particularly in stressed market conditions.

Figure 3 shows the net inflows to property funds from retail clients between 2003 and 2009, compared with the IPD monthly index total return performance. This demonstrates clearly the challenge faced by fund managers in having to purchase assets in a very strong market and then selling aggressively when the market weakens.

In all market conditions it can take some time to source and purchase physical assets. This is exacerbated in strong bull and bear markets when it is often harder to source stock or potential purchasers respectively. Using derivatives exposure as a liquidity layer could help avoid cash drag associated with the problem in bull markets and allow rapid sales to meet redemptions in a bear market.

Figure 3 Net inflows to retail property funds compared to property market performance



Source: IMA, IPD

Rebalancing portfolio structure

Perhaps the most obvious use of property derivatives by both managers of multi-asset portfolios and managers of property portfolios is the fast and efficient rebalancing of portfolios. For managers of multi-asset portfolios comprising, for example, equities, bonds and property, derivatives allow strategic or tactical rebalancing through trades at the All Property level. The advantages, as discussed earlier, allow the multi-asset investment manager to access diversified property returns quickly, or to hedge or down weight property exposure. Trades at the All Property level will also allow international asset allocators to adjust relative exposures to certain markets; thereby enhancing the benefits of diversification. In contrast, trading at the sector or sub-sector level is likely to be more appealing for managers of property portfolios as this would allow the manager to access sector level returns, hedge portfolio exposure to particular sectors, or switch sector exposure efficiently and quickly.

The same logic outlined in the hedging section above can be applied here. For short-term rebalances it is unlikely that a physical sale and purchase strategy would have been considered. Where the time frame was long enough for this to be a meaningful comparison, it may be appropriate to include elements of relative transaction costs etc. to the analysis.

Relative value plays/arbitrage

Property derivatives allow investors to employ more complex strategies to arbitrage perceived mispricing between property-related assets. This can include arbitrage or relative value plays within property derivative pricing or between other property-related assets and property derivatives. In addition, investors can employ relative value plays between property derivatives and other non-property related markets and instruments, such as inflation or equity indices.

For example, an investor with a firm view on the shape of future returns can trade on the implied forward curve, either by taking a single long or short position or a combination of long and short positions on different maturities. In addition, investors with firm views on the shape of returns from different sectors or different countries can make similar long/short trades on different markets. So, a property company could manage its exposure to the property market cycle, providing the trades are made before they become the consensus view. Investors in REITs can also use property derivatives to arbitrage perceived mispricing between expectations of returns implied by the derivatives market and those implied by the share price premium or discount to net asset value (NAV).

Considerations when using property derivatives

Risk premium

The implied forward returns described above assume that an investor is willing to pay a fixed rate for an uncertain property return. In reality, an investor may well demand a risk premium for doing so. The quantum of this risk premium is difficult to determine. It is widely considered that the risk premium demanded by investors over the risk-free rate of gilts for holding direct property is in the order of 2%-3%, with possibly an additional illiquidity premium to take account of the illiquidity of the swaps market. It could be argued that for a shorter-dated contract, such as one maturing in less than a year, the risk premium is lower, given the greater certainty of returns and cashflows from the swap. As a result, the implied returns of the swaps market are dependent on one's interpretation of the forward curve, and assumptions of the quantum of any risk premium that should be attached to the prices.

The subject of pricing in the derivatives market is complex. Pricing theory is likely to develop further as the market matures in the UK and internationally and a longer time series of pricing is recorded. Current pricing may be a function of an immature market and exceptional property market circumstances. In a more liquid market with a more 'normal' property market environment, we may see pricing tending to trade within narrower bands.

There is a growing body of literature on the subject of pricing and, in particular, a risk premium. For more details a literature review would be advisable but is beyond the scope of this publication.

Anticipation of marked-to-market volatility

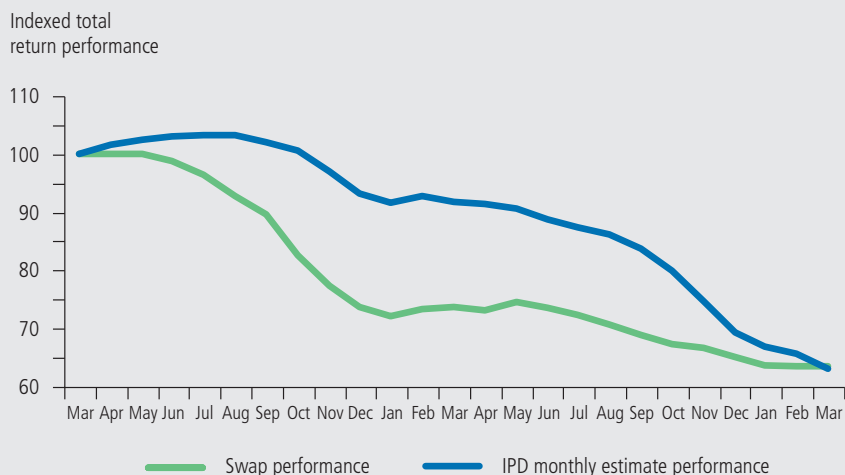
Marked-to-market volatility is one of the characteristics of property derivatives most alien to the average property investor. Whilst property valuations move relatively smoothly as transactional evidence in the physical market becomes available, the valuations of property derivatives contracts can move more quickly in response to changes in sentiment. Although this happens in the transaction prices of buildings as well, the effect is much less transparent. It only impacts the buildings that will be bought and sold in the short term through prices paid, rather than those held in a portfolio through valuations. With derivatives, this sentiment affects not only the prices achievable in the market but also the valuation of assets in a portfolio, since prices and valuations are one and the same.

This characteristic means that even if returns turn out as expected over the life of the contract, changes in sentiment could lead to greater volatility in delivered returns compared to physical property – at least as measured by valuations. It should be noted that this is likely to be reflecting only the volatility in real transactable prices for physical property, which is smoothed out in the valuation-based IPD indices.

Marked-to-market movements anticipate the future expected payments implied by the swap before they are due, as shown in **Figure 4**. Changing sentiment in the physical property market feeds through to swap pricing and valuations almost immediately, whereas it takes time for this sentiment to be felt in valuations of physical property. This means that the performance of derivatives tends to lead that of physical property. During the falling market shown in **Figure 4**, this led to swap values falling faster than the physical. However, in a rising market, the improvement in sentiment would lead to swap contracts rising in value more quickly, having the opposite impact on portfolio returns. This is a very important factor to be considered when looking at a derivative strategy – particularly in the context of a physical portfolio¹.

¹ The example in **Figure 4** shows the total return performance of the IPD monthly estimate of the Annual Index compared to the 'quasi total return' performance of a swap contract. The 'quasi total return' of the swap is calculated by using the notional value plus MtM value of the swap as denominator in the total return formula. The swap in this example is a Long Dec 2010 All Property Contract traded at the end of March 2007 for a fixed rate price of 605bps.

Figure 4 Marked-to-market movement volatility 2007-09



Source: PRUPIM, ICAP, CBRE/GFI, IPD

Pre-investment analysis can help in the calculation of expected cashflows generated by a derivative contract but the profile and timing of how the total returns on a derivatives contract are delivered will be different as the marked-to-market valuation of the contract will move ahead of those payments. This is nearly impossible to model accurately pre-trade since it is based solely on sentiment. Nevertheless, an appreciation of how the returns are likely to be delivered is important so that considered monitoring of the positions can be done.

More detail on the impact of mark-to-market movements on total return calculation can be found in the performance measurement section but the main point to note here is that marking to market can increase short-term volatility of the fund.

Funding levels

When it comes to standard unfunded contracts, such as futures or swaps, the notional of the contract is not exchanged at initiation. In the case of swaps, no notional is exchanged and with futures only an initial margin is required. For both, the position is geared unless funding is held

elsewhere to de-gear the position (or if one shorts the index, which has the added advantage of cheap de-gearing). This can be attractive because gearing using a derivative is very cheap compared to gearing created by borrowing against physical property. The gearing level can also be adjusted very simply, quickly and cheaply by adding or removing funding to the existing position or by extending or reducing the swap exposure through additional contracts.

If contracts are going to be employed in a geared position, the impacts of this need to be considered in the analysis of the trade.

Considering collateralisation

Banks that transact unfunded property derivatives with clients need to be comfortable that, should a derivative make a loss, the client will pay the bank the amount owed. In the case of corporates and certain institutions, the respective bank's credit committee will have taken the view that these clients are capable of paying and will therefore be prepared to allocate an unfunded and unsecured derivative line to them. Beyond that, and in the case of weaker credits and funds, or where the derivative is undertaken through an exchange, the bank/exchange will require the deposit of collateral sufficient to cover anticipated losses on the contract.

As the marked-to-market value of any swap or futures contract moves over time, collateral is posted by the party that is 'out of the money' (because the present value of the remaining coupons is negative) as security against default on expected coupon payments. Swaps are traded within a collateralisation system where the frequency of postings and the assets used for collateral are set out in the credit support annex agreement between the two parties. For futures, collateralisation is effectively achieved through cash margin payments.

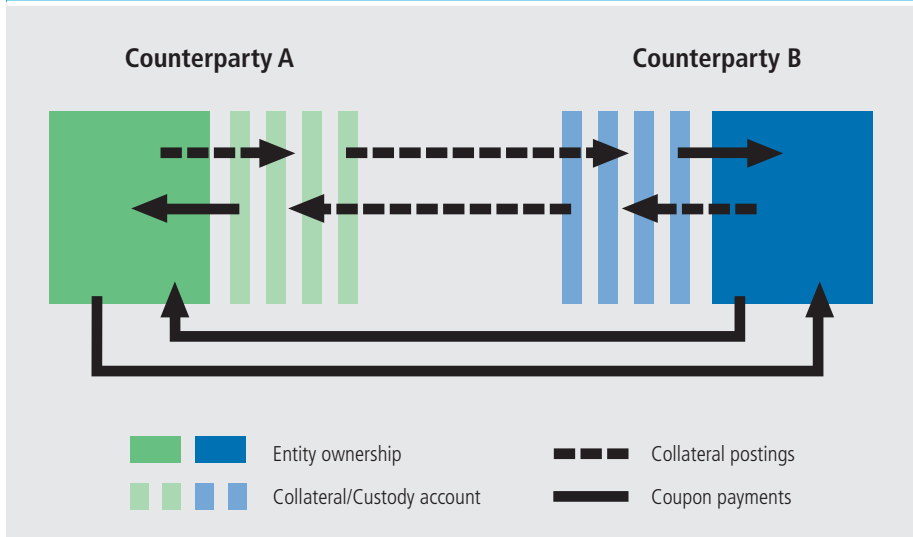
This is another key characteristic of property derivatives that does not apply to a physical property holding. When a building appreciates or depreciates in value, any gains or losses are only experienced on paper and are not realised until the asset is sold. With a swap or future's position, collateral is moved in the relevant direction so any gains or losses require cash or other assets to be posted. The obligation to post security in the future where the market moves against your position can produce a future liability. This will create a potential cash flow event that needs to be actively managed.

This is most relevant when considered in the context of a standard property fund. Often property funds only hold physical property and cash. Some may hold unlisted property funds and even fewer listed securities but the point is that most will not hold assets that are suitable as collateral. Cash, it would seem, is the only asset available for collateral purposes. If such firms were to start

trading swaps or futures, the cash holding would begin to have two purposes. With potential calls on it coming from out of the money swap positions as well as redemptions from investors. Active management of this issue in such funds is even more important.

The added complication for swaps is that although either cash or assets may be received in collateral payments, they can only be held in the collateral account – they still belong to the other counterparty and are only held in case the counterparty defaults on a coupon. Only once a coupon is received can the cash be made available for reinvestment elsewhere in the fund. Even though a position may have made, for example, 20% intra year and associated collateral received, this cannot be used for other investments until the coupon payment date has been reached. Figure 5 describes this dynamic between the counterparties.

Figure 5 Counterparty to a swap – collateral payments



III Execution

Access to the market

OTC contracts – Relationships with banks and brokers

The majority of property derivatives trades are executed over the counter (OTC) via bilateral negotiations with counterparties rather than with an exchange. In nearly all of these transactions, the counterparty will be a bank and access to the market can therefore be achieved through direct contact with the bank. However, access can also be achieved indirectly through the use of a broker, in a similar way to the physical property market.

Choosing the best route to market will be made in the context of best execution. The aim of best execution is to achieve the best result in terms of both pricing and transaction costs in order to maximise returns. This should be enough motivation for any entity, but fund management houses also have a regulatory responsibility to achieve best execution for the benefit of their clients.

The judgement over whether to trade directly with a bank or use a broker will come down to balancing the potential for a broker to source a better price than could be sourced otherwise against the brokerage fee charged.

A pragmatic approach to market interaction must be taken and the relative benefits of each approach be assessed on a case by case basis.

List of players – brokers and banks

IPD licensed banks

Bank of America Merrill Lynch	HSH Nord Bank
Barclays	HSBC
Bayerische Hypo	JPMorgan
BNP Paribas	Morgan Stanley
Calyon	National Bank of Canada
Commerzbank	Robeco
Credit Suisse	RBS
Deutsche	Santander
Eurohypo	Toronto Dominion
Goldman Sachs	UBS

Brokers

C&W / BGC
CBRE / GFI
DTZ / Tullet Prebon
Hoare Capital
ICAP
Tradition

Exchange traded contracts – Eurex

In a deep and liquid market, futures pricing is transparent and there is no need to access the market via either a bank or a broker if the firm is a member of the exchange. This is, however, unlikely to be the case for many end users. Although this does not preclude investment by end users via the exchange, it would have to be done through an exchange member, being a bank or broker. Despite this, the price would be transparent and the service involved would be that of simply providing access to the exchange, rather than providing or sourcing a price.

NOTE:

The Eurex futures exchange has not yet achieved such a level of liquidity. Pricing is still derived largely from OTC market quotes.

Execution

Liquidity and price transparency on All Property contracts in the UK is reasonably good, given the infancy of the market and recent financial turbulence. At present, one can view five-year forward prices for both buying and selling from several banks and brokers. Sector and sub-sector level pricing is less transparent and these contracts are priced on a more bespoke basis. Although there is some evidence of banks starting to make a market in sectors and sub-sectors, as yet this activity is limited and most of this pricing is based on axes (the specific interest that traders have in a certain type of contract, based on their existing positions).

There is a tendency for property investors to make decisions based on published prices, which has led to activity being confined largely to the more liquid All Property contracts. Where pricing information is not yet published it requires the potential trader to become a price maker, in much the same way he would if bidding on a physical property asset. Property portfolio managers are among the best-placed individuals to make prices on property derivatives since they hold the underlying risk and understand it best. To have a chance of being able to execute trades on the less liquid indices, one must be willing to make a price. Even if this is not matched by a counterparty immediately, a process of orders being built up will help to close the spread progressively until trades are done.

With this in mind, when approval is sought for a derivative transaction, it should be sought in flexible terms so that approval is given to trade within a pricing window. This way, there is room for negotiation with the counterparty over a short time period, without the need to go back to an investment committee for approval. Pricing parameters are obviously employed in physical transactions in this way but it is particularly important for derivatives transactions, given the speed at which changes in sentiment can affect pricing and the appetite to trade.

Processing a derivative trade

The implications of the derivative instrument proposed must be considered across all business functions, from accounting to performance measurement, compliance and investment operations.

For each function, thought needs to be given to:

- the key risks to each team/unit associated with the derivative;
- the proposed approach to mitigating or managing these risks; and
- whether there is competence and capacity to manage the derivative.

The business units involved will vary from organisation to organisation. Regardless of whether functions are separated into teams or outsourced completely, the issues to be considered remain the same – as outlined below:

Legal and compliance

There will be a lot of detail that should be discussed with legal professionals. The list below highlights the key issues to be considered:

- identify documentation risks;
- ensure that the firm is adequately protected by legal documentation;
- ensure clear definition of all terms included in documentation;
- identify any external legal parties consulted; and
- ensure an appropriate ISDA master agreement, any variation on the ISDA Property Index Derivative Definitions and credit support annex (CSA) is in place if necessary (for swaps).

Further information regarding legal preparedness to trade is provided in the section on documentation below.

For a corporate entity, these matters are likely to be more straightforward. One single set of ISDA and CSA agreements with each counterparty are likely to be sufficient for all the firm's property derivatives activities. For fund management houses, each fund may be a separate legal entity. Since the contracts will be owned by the fund rather than the fund manager, separate documentation will be required for each fund.

Documentation

The documentation for a property derivative transaction differs according to the type of contract, broadly divided into:

- over the counter (OTC) contracts;
- futures contracts via Eurex; and
- property linked notes.

OTC contracts

OTC contracts are documented by a written form of 'confirmation', which contains the commercial terms of the contract and some standard conditions (legal boilerplate) dealing with issues; for example, what happens if publication of the underlying index is delayed, or if it ceases to be published altogether.

The ISDA Property Index Derivatives Definitions 2007 were published with a view to standardising legal boilerplate. It was recognised that standardisation was helpful, in order to make the process of agreeing documentation quicker, and the operation of the market more efficient.

It had been hoped that a unified set of definitions could be devised for use in the UK and USA. This was only partly achieved because of differences in practice and approach to derivative transactions on the two sides of the Atlantic. This handbook concentrates on London market practices. Also it is worth noting that the Definitions are more orientated towards banks than end users, as the former were involved in their conception to a greater extent. Certain respects where end users may wish to deviate from the Definitions are identified below.

The confirmation will usually be issued in draft by the bank party and agreed (after negotiation, if necessary) by the end user, usually by email. In more established liquid markets such as sterling interest swaps or forward FX, the transaction will be made over the telephone and the confirmation will follow after the event – hence the name. The OTC property swaps market is not at that stage of maturity and best practice is that the confirmation should always be pre-agreed, certainly for the first trade between parties. For subsequent trades, once a pattern has been established, parties may find it acceptable to deal with confirmations after the event.

The confirmation should be entered into pursuant to a pre-agreed ISDA master agreement between the parties. As the name suggests, an ISDA master agreement contains common terms and conditions which will apply to any derivatives trade between the parties. It will contain a variety of agreed positions on matters such as payment offsets (to reduce credit risk where there are a number of derivatives between parties), tax gross-up, events of default and no-fault termination events, the mechanics for terminating trades early and the method of calculating the amounts due on an early termination. ISDA master agreements come in two forms, commonly known (by the years when they were issued), as the 1992 Master and the 2002 Master. In each case, the text of the master agreement itself is rarely amended. However, the accompanying schedule to the agreement can be used by the parties to tailor the standard text to their requirements. The wording of a confirmation will normally override anything in an underlying master agreement.

Sensitive issues for negotiation typically concern what happens if the method of calculating an index changes during the life of the derivative contract and how the value of the derivative contract would be calculated in the event of its early termination – although how sensitive these issues are will depend on the index on which the trade is based and the length of the agreement. A long-term contract based on a sub-sector index with a small sample size throws up concerns that should dwarf those arising from a short-term contract based on the IPD All Properties Annual Index.

The ISDA Definitions suggest a range of outcomes if significant unanticipated events occur with respect to the index: the contract might break early unless the parties agree something else; one party (or, less commonly, an independent party) may specify what it regards as a fair method of continuing the contract (such as by selecting an alternative index where the original index is discontinued), or, less commonly, the parties may agree to abide by the majority view of market participants.

End users considering the ISDA Definitions will wish to review carefully the definitions of ‘Methodology adjustment’ and ‘Methodology Event’; the latter in particular is not as clear as parties might like. As regards the former, end users may have differing views on whether a change in the sample size of a given index should be regarded as significant, particularly if the chosen

index has a relatively small sample size to begin with. There is a range of possible outcomes here depending on the specific parties involved, their bargaining strength and technical capabilities.

The method for valuing a contract on early termination will depend on the reason that this has happened. If a party has defaulted, e.g. gone into an insolvency process, the underlying ISDA master agreement will usually allocate the valuation duty to the other (non-defaulting) party, and the methodology for calculating the value will usually involve seeking quotations from other parties in the market and/or calculating the gain or loss on early termination in accordance with other more flexible methods. If a contract terminates early because of tax problems, the position is similar, with the party affected by the tax problem usually adopting the role of the defaulting party. Where the reason for termination is the discontinuance of the underlying index, ideally the documentation should provide for a solution. In practice, this is very difficult to achieve.

One circumstance that is rarely covered in documentation is the possibility of a party simply wishing to bring about early termination voluntarily. This is done generally by agreement on the termination value of the contract. If the parties cannot agree, they will have to continue the contract. For an end user who wishes for some flexibility, such as a fund using a derivative to acquire synthetic short term exposure pending bricks-and-mortar investments over an uncertain timescale, this implies adopting a flexible hedging strategy – perhaps a series of contracts maturing over a period. Whatever is done, it is unlikely to involve agreeing an option to terminate, although there is no reason in principle why this cannot be done if the parties agree and the price is right. End users should therefore ensure they have an alternative to a voluntary termination where they cannot agree a price. Some early contracts contained an express option to put the contract back onto the bank at the price determined by the bank to be the market value. However, it was quickly concluded that such an option added little or nothing, beyond perhaps a cosmetic appearance of liquidity.

In order to better manage counterparty risk, end users should consider whether the standard documentation gives them the ability to assign the swap to another market participant, subject to satisfactory credit.

Futures contracts via Eurex

Eurex has specified standard terms for its property futures contracts. These are entered into by Eurex members on the basis of the published contract specifications and the applicable Eurex membership rules and regulations. Eurex itself will act as, in effect, the calculation agent to determine various boilerplate issues such as whether there is a suitable substitute index for one

that has been discontinued. This may be attractive since Eurex, as a central counterparty, should be disinterested in the pricing of the contract. However, some participants may not be as comfortable with the exchange undertaking the resolution of some issues, without precise guidance as to how the exchange will make its determination. There is no master agreement between the end user and the exchange. As mentioned previously, an end user that is not a Eurex member, would have to enter into a Eurex futures contract via a member.

Property linked notes

The documentation for property linked notes typically consists of a 'base prospectus' produced by the issuing bank. This sets out certain standard terms and conditions for a variety of bonds and notes that it may issue from time to time, and a specific supplement setting out the precise terms and conditions for the property linked notes in question. Marketing of the issue is usually done on the basis of a very short set of indicative terms and conditions, which are not legally binding and are entirely subject to the formal documentation.

Investors are often informed at the outset that the documentation is standard and cannot be varied. No reasonable investor will wish to enter into a legally binding investment on this basis. Negotiating changes can be difficult, with the end user commonly being told that a certain attractive quoted price is only available for a short period of time after which it will be withdrawn, the implication being that the price will be less favourable after this period.

Dealing

It is important to identify and document detailed procedures for dealing. In larger institutions, there will often be electronic systems for trading derivatives. However, property derivatives may not fit with these systems and so a manual process involving paper trade tickets may have to be developed in the short term.

The exact process will depend not only on the functional capability and resourcing levels but also on the regulatory status of the firm and individuals involved. It will therefore be necessary to identify who will execute the trade and whether they have approved person status, as discussed previously.

Investment operations

Life cycle management

Throughout the life of a derivative contract, various events occur such as execution, coupon payments/receipts and collateral postings. There should be a team responsible for managing these events and taking care of all the related administration, especially in larger organisations. For smaller firms without these resources, it may be possible to outsource them.

Collateralisation

The fair market value of a swap contract at trade date would be zero, but for the fact that the mid-market price and the transaction price are unlikely to be the same. As market sentiment changes, the contract will move into the money for one counterparty and out of the money for the other. Assets posted as collateral will move from one counterparty's collateral account to the other. This will occur daily or weekly, depending on the details of the CSA. This movement of assets is more frequent than the average property portfolio manager is used to. There has to be the ability to execute these actions and to administer them properly. This function is often outsourced to a third party.

Static data

Firms need to consider instrument set-up on trade logging systems and links with accounting and performance measurement systems. The economic characteristics of the trade must be such that they can be inputted into the relevant systems and subsequently accounted for and included in performance measurement calculations. This may be a problem for property firms, where systems have been developed specifically for physical property assets. Investment in systems development or outsourcing of such activity may need to be considered. It may be that treasury systems, used by the end user for monitoring and managing interest rate hedges on its borrowings, can be adapted for property derivatives.

Settlements and transaction processing

Identify the procedure for settlement and processing. Generally, this will be quite standard but due diligence processes should ensure that no characteristics of the trade will cause problems.

Income

Ensure that income can be correctly accrued on internal systems. It is particularly important for unitised funds where units have to be priced and potential income disbursed. This is more difficult for contracts that have floating coupons rather than fixed.

Pricing

Ensure that a suitable price source has been identified. Often an independent third party source for pricing is requested. This may involve price and valuation data being published on a source such as Bloomberg via an ISIN number or, if counterparty valuations are acceptable, automatic emails from the counterparty.

Tax considerations

The UK tax rules under the Finance Act 2004 brought property derivatives within the existing tax regime applicable to other derivative contracts, but with capital gains treatment for instances where that is considered more appropriate.

For non-exempt entities that are subject to corporation tax, the tax rules operate in different ways depending on the nature of the holder or writer of the property derivative contract.

- For an organisation carrying on a trade, gains or losses on the derivatives would be taxed as trading income or relieved as trading losses.
- If a company carrying on a life assurance business is a party to a derivative contract then, even if that contract is regarded as being for trading purposes, it may benefit from being taxed under the chargeable gains regime.
- For those not carrying on a trade, where the underlying subject matter of the derivatives contract is mainly land (and/or fixtures), gains or losses can be liable to tax on chargeable gains rather than corporation tax on income.

A key concern at the consultation stage, before the legislation was passed, was the possibility that gains and losses could arise on the same property derivative – because of the way in which the ordinary chargeable gains rules work, losses on derivatives arising in later years could not be

carried back to shelter gains arising in earlier years. Accordingly, there is a limited two-year carry back of losses on derivatives in certain circumstances.

As with all tax rules, their precise scope and whether they apply in particular circumstances needs scrutiny by professional advisors whose advice should be sought if considering the use of property derivatives.

IV After trade systems

Accounting systems

Accounting capability will be specific to each organisation and therefore few standard answers or tips can be provided in this area.

If a derivatives trading capability is to be developed, there should be detailed consultations with the accounting function or department in the organisation. Obviously, there is more control over development if accounting is done internally, as opposed to it being an outsourced function. In either case, the capability of the function to account properly for derivatives must be assessed.

Performance measurement

The investment performance of the derivative position will be a combination of the movement in marked-to-market valuations of the derivative, as well as receipt or payment of any coupons.

Marked-to-market valuation

Why?

One of the criteria of most regulatory regimes is that an asset must be marked to market at least once a month. Therefore, for a derivative investment to be permitted for any of the funds concerned it needs to be marked to market.

For the unitised funds, assets must be marked to market so that the fund asset values reflect transaction prices in the market in case redemptions on the fund require swift sales. This will limit the divergence between unit pricing and asset values.

For corporate entities, International Financial Reporting Standards (IFRS) accounting rules, which also require contracts to be marked to market, would normally apply. However, if specific circumstances mean that regulatory or accounting rules do not require positions to be marked to market, the contract may be carried in the books at notional value.

The remainder of this document assumes that the contract has to be marked to market, since this is the norm.

What?

Marking an instrument to market is the act of adjusting the carrying value of the instrument in line with market price movements. This means that the accounting value reflects the price at which the instrument could be sold in the current market (adjusting for the bid-offer spread to a mid-market price). Marking to market makes a lot of sense if there is a reasonable chance that the instrument may have to be sold earlier than planned. The chances of this happening are probably higher on unitised funds, where redemptions are more volatile and there is less control over the timing of investor withdrawals. However, where an asset is certain to be held to maturity, marking to market can introduce unnecessary volatility in intermediate investment returns with no additional benefit, unless it is a hedge and the underlying hedged asset is also marked to market.

How?

Where a market trades in liquid, standardised assets, market values of investments are very easily obtained by looking at the market clearing price, e.g. for FTSE 100 equities. In markets for less liquid and more heterogeneous assets, such as the current property derivatives market, the task of marking to market is less straightforward.

Property derivatives can vary in their tenor, index basis and structure. This means that there are relatively few identical instruments trading sufficiently regularly to determine a reliable clearing price. An additional complication is that the market, at the moment at least, is predominantly OTC. This means there is no central clearing price for the market and hence no single source from which to gather pricing data.

To circumvent these problems, marked-to-market models must be constructed to calculate valuation estimates with the available data. Starting with first principles, the value of any investment should be equal to the net present value (NPV) of expected future cashflows. The market clearing price of an asset should therefore be equal to the NPV of the market's aggregate expectation of future cashflows. These expectations can be derived from a decomposition of the forward curve for the index concerned, which is itself constructed from the pricing across instruments of varying tenor. Discounting back, these market expectations of cashflows will yield the marked-to-market value of the contract.

The exact structure of the cash flows that are being discounted varies according to the instrument being traded and its tenor. The structure of the cashflows remaining also depends on the time at which the valuation is made, since the value will only reflect remaining cashflows rather than all of them from the trade date onward. **Figure 6** illustrates the typical cashflows involved.

Figure 6 Using cashflows to determine marked-to-market values

Short swap (fixed rate conversion)

Years	t=0	t=1		t=2	t=T
Pay leg		IPD TR		IPD TR	IPD TR
Receive leg		Fixed return		Fixed return	Fixed return
Net		Fixed return – IPD TR		Fixed return – IPD TR	Fixed return – IPD TR

Structured note example

Years	t=0	t=1		t=2	t=T
Pay leg	Notional				
Receive leg		IPD TR		IPD TR	IPD TR + Notional
Net	– Notional	IPD TR		IPD TR	IPD TR + Notional

Long future

Years	t=0	t=1		t=2	t=T
Pay leg					Fixed return
Receive leg					IPD TR
Net					IPD TR – Fixed return

Valuation date (t=1.5)

Marked-to-market values at time t=1.5 (measured in years) would be equal to the NPV of the remaining cash flows t=2 and t=T discounted back to time t=1.5 rather than t=0.

From this illustration, it is clear to see that the exact definition of the cashflows and when they occur will affect the marked-to-market value as much as the market's expectation of the level of those cashflows.

As mentioned earlier, one problem with OTC markets is that no market participant or agent is party to all transactions in the market and so any forward curve is only partial and so does not provide definitive pricing information. In this environment, it is necessary to have an independent third-party pricing source to check counterparty valuations. In the case of the IPD UK All Property contracts, there is reasonable liquidity on these contracts and indicative pricing is published regularly across the forward curve.

This problem is more difficult to solve in valuing sector and sub-sector contracts or any contract from other jurisdictions. This is because indicative pricing is published less often and, when it is, it is usually partial in its coverage or the curve itself is less accurate due to lack of trading. Finding an independent third-party source for such pricing is also more difficult.

Who?

The counterparty that is in the money will make a call for collateral, based on the marked-to-market value of the swap. This call is likely to be based on its assessment of marked-to-market valuation. The other counterparty should then check these valuations, either through an internal risk team or by a third party, before collateral is posted. Where the variance in the two valuations is greater than the set tolerances, the first valuation should be challenged.

When?

Regulation requires funds to undertake marked-to-market valuations on a monthly basis. For other organisations, frequency of valuation must be in line with their reporting cycle, although greater frequency may be deemed useful for managing positions.

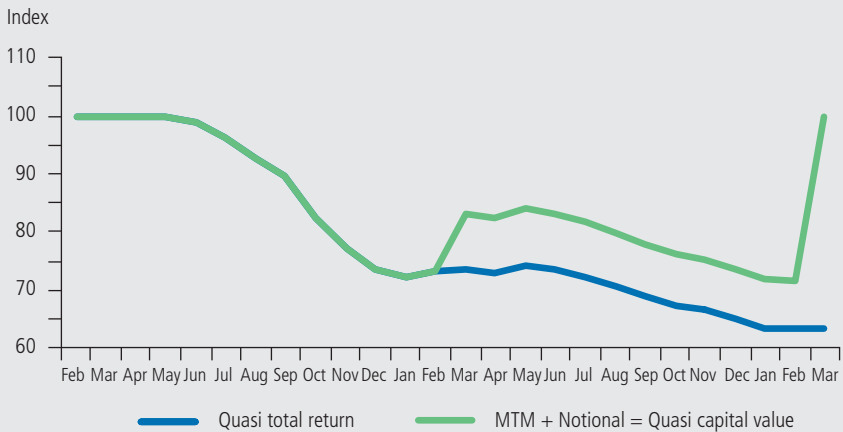
The impact of marked-to-market volatility and cashflow timing on performance profile

Volatility in swap pricing can contribute to significant differences in the valuation movements of swaps compared to physical property. Furthermore, delays in the production of market data required to calculate the swap leg of a trade result in coupons being paid in the year following the one to which they relate. These factors can lead to performance being delivered in a different profile to that expected before trading.

Although expected performance of the swap over the life of the contract is reasonably simple to analyse, understanding how this performance is delivered over time is also important. This will ensure that the actual performance that is delivered month by month does not come as a surprise.

It is impossible to calculate a total return for a swap since it has no capital employed and therefore has no denominator to enter into the total return calculation. However, in order to demonstrate the performance characteristics of a swap, it can be helpful to construct a 'quasi total return' data series by using the sum of the notional and marked-to-market value of the swap. This is the equivalent of the denominator in the total return calculation, in the absence of capital employed.

Figure 7 Movement in marked-to-market and notional values 2007-09



Source: PRUPIM, ICAP, CBRE/GFI, IPD

By way of illustration, **Figure 7** shows a trade where an investor enters into a contract in January 2007 to receive the All Property total return on IPD's Annual Index in return for a fixed rate of 6.8%. The contract is for two years with exposure commencing 31 December 2006 and has a notional value of £100m. The reporting and annual calculation of the quasi total return achieved is reliant on two pieces of key data, namely the marked-to-market value of the derivative, which can be calculated monthly using data provided by an independent third party, and the annual total return achieved on IPD's All Property Annual Index.

The graph shows the movement in the combined marked-to-market and notional values over the life of the contract, being the quasi capital value of the contract. At first glance, it would seem that this quasi capital value is very volatile. But this data series ignores the actual coupon payments in March each year, which would offset the sharp movements. The swap valuation is simply a net present value of the expected coupon payments. As those payments are made, the value of the contract automatically adjusts to reflect each payment. When quasi total returns are considered, one can see how the coupon payments and swap valuation counteract each other to provide a smoother total return profile. The details of this dynamic become apparent in the numerical example in **Figure 8**.

Figure 8 shows how the deterioration in market sentiment from May 2007 led to a fall in the marked-to-market value of the swap. By the end of 2007 market pricing had deteriorated to a fixed rate -7.5% pa compared to +6.8% at trade date and hence the value of the combined marked-to-market and notional values had fallen to £72.50m. This drop reflects not only market expectations of the coupon the investor will have to pay out to the counterparty in March 2008 (relating to 2007 IPD returns), but also market expectations of the coupon payment in the following year (relating to 2008 IPD performance). The fall is so large because it is reflecting the expectations of two years of coupon payments rather than just the current year's IPD performance.

Figure 8 Profile of the swap during 2007

2007	Jan	Feb	Mar	Apr	May	Jun	
MtM +							
Notional value	99.43m	99.52m	98.94m	98.93m	98.97m	97.73m	
Return	-0.6%	0.1%	-0.6%	0.0%	0.0%	-1.3%	
<hr/>							
2007	Jul	Aug	Sep	Oct	Nov	Dec	Total
MtM +							
Notional value	95.33m	91.57m	88.45m	81.30m	76.25m	72.50m	
Return	-2.5%	-3.9%	-3.4%	-8.1%	-6.2%	-4.9%	-27.5%

Source: PRUPIM, ICAP, CBRE/GFI, IPD

The contract also requires the payment/receipt of the swap leg (6.8% v IPD Annual Index), but publication of IPD's Annual Index for the 2007 year is not available until the end of February of the following year, making it impossible to calculate and pay/receive the swap leg until three months into the 2008 year. Unable to transact the swap leg in 2007, the only component of quasi total return reportable in 2007 is the capital element, i.e. the total movement in marked-to-market value in 2007 (-27.5%). Compared to the performance of the IPD Annual Index (-3.4%), this looks unfavourable, but this is because the contract is also accounting for the expected performance of 2008.

In 2008, the second and final year of the contracted exposure, the marked-to-market value continues to account for movements in market sentiment but this time only for the current year's IPD performance (2008). It also takes into account a coupon payment, which equates to a net payout by the investor of £10.2m (based on the 2007 Index return of -3.4%, compared to +6.8% at the trade date).

As before, the 2008 total return achieved by the derivative will take into account the movement of the marked-to-market value (from £72.50m to £72.87m) – see **Figure 9**. The value ticks up in March 2008 because the marked-to-market value recognises that the first coupon has been paid, and is no longer a liability that has to be accounted for in the value of the contract. The value of the contract from this point onwards only accounts for the expectations of the final coupon.

Figure 9 Profile of the swap during 2008

2008	Jan	Feb	Mar	Apr	May	Jun	
MtM +							
Notional value	71.03m	72.12m	82.68m	82.04m	83.57m	82.52m	
Return	-2.0%	1.5%	0.5%	-0.8%	1.9%	-1.3%	
2008	Jul	Aug	Sep	Oct	Nov	Dec	Total
MtM +							
Notional value	81.29m	79.40m	77.41m	75.54m	74.77m	72.87m	
Return	1.5%	-2.3%	-2.5%	-2.4%	-1.0%	-2.5%	-11.9%

Source: PRUPIM, ICAP, CBRE/GFI, IPD

Combining this profile of marked-to-market movements with the impact of the coupon payment delivers a quasi total return for the swap of -11.9% for the year 2008, compared to IPD's Annual Index return of -22.1%. Essentially, the contract had already taken much of the hit for expected IPD 2008 performance in the returns recorded in 2007 and hence outperforms this year.

Despite the investor acquiring a two-year contract, the swap leg applicable to the 2008 year cannot be paid out until the following year. Some returns are yet to be paid and go into 2009 even though exposure to the market has expired. A marked-to-market value is therefore required for the first three months of the third year. Once the final coupon has been paid, the value of the swap returns to zero and hence marked-to-market and notional value = notional = £100m, see **Figure 10**. This is because there are no future cashflows remaining to be discounted back to today's value. The uplift in the marked-to-market value in March is offset by the coupon that is actually paid.

Figure 10 On expiry of the swap

2009	Jan	Feb	Mar	Total
MtM + Notional value	71.28m	71.13m	100.0m	
Swap leg			-28.9m	
Return	-2.2%	-0.2%	-0.1%	-2.5%

Source: PRUPIM, ICAP, CBRE/GFI, IPD

In 2009, whilst the contract on the derivative has actually expired, the investor still has to pay out the net swap leg applicable to the 2008 year of 28.9% (the difference between +6.8% and -22.1%) of the notional £100m value. With the marked-to-market value rising from £72.87m in December back to the notional price of £100m in March, the investor actually achieves a return of -2.5% due to the swap payment of £28.9m. The return for this period of a swap contract will generally be small since it is only driven by differences between expectations of the 2008 IPD return in December compared with the actual outturn.

Figure 11, sets out a summary of the transaction, showing how the derivative contract brings index performance forward so it hits the portfolio returns earlier than for those of physical property. The fact that this contract was bought when implied expected returns for IPD were reasonably positive (6.8% over the contract life) accentuates the negative performance because the asset was bought at a premium over the IPD Index, just before the market fell substantially.

Figure 11 Summary of the contract performance

Returns actually delivered	2007	2008	2009
Derivative trade	-27.5%	-11.9%	-2.5%
IPD Annual Index	-3.4%	-22.1%	

Source: PRUPIM, ICAP, CBRE/GFI, IPD

Given that the short history of derivatives pricing coincides with a significant market downturn, an example of this nature will inevitably show negative performance relative to IPD. The illustrative contract was not an attractive investment but it does highlight the timing issues relating to swap performance. Clearly the optimal strategy in 2006 ahead of the market downturn was to short the market. The profile of performance would have been similar but inverted, producing strongly positive returns. That would have helped to insulate a physical portfolio against the market downturn.

The forward-looking nature of derivative pricing that, in this example, led to the negative performance of the IPD Index being brought into swap performance earlier than for physical property, had a greater negative impact because the contract was bought at the top of the market. Buying a long contract at the bottom of the market (e.g. January 2009), when exposure could have been bought at a significant discount, would turn this characteristic into an added benefit. As market sentiment and derivative pricing rallied, this would boost swap performance relative to the IPD Index.

These issues are very important to understand when considering derivative strategies. They can lead to the delivered performance being different from that forecast but, if understood properly, can provide an extra dimension to investment performance.

Combining marked-to-market valuations with coupon payments

A common question from property fund managers when looking at total return swaps is; 'How will they affect my portfolio performance?' IPD is used to measuring the types of vehicles that have been available for many years, such as direct property holdings, units in pooled funds, shares in REITs and IPD index linked bonds. However, the measurement of swaps in a property portfolio is not quite so straightforward.

The main difficulty with total return swaps is that they have no capital employed; swaps do not involve an initial cash payment.

The two main requirements for measuring the performance of a swap are marking to market, i.e. capturing the profit or loss by reference to the open market at each month end, and the portfolio rebalancing effects of trading sector and sub-sector indices. The way that this is dealt with in the IPD system is to code the swap as two assets; the first will reflect the notional value (positive for long positions and negative for short positions), the sector or sub-sector of the trade, the swap payments and the change in marked-to-market value as well as any transactions costs. The second asset will be the inverse of the first so that the total capital value of the portfolio does not actually increase or decrease because of the swap.

IPD Performance measurement methodology

Total return swap – an example

By way of demonstrating how IPD will incorporate a swap into portfolio performance measurement, Figures 12, 13 and 14 set out the attributes of an illustrative swap and the resultant values and cashflows derived through the course of a calendar year.

Figure 12 Swap attributes

Notional value	£10m
Tenor	1 year, starting 31 December 2008
Traded	March 2009
Position	Long
Price	-18%, fixed
Index	All Retail

For the purpose of measuring impact at portfolio level, only the notional value plus marked-to-market movements and the swap cashflows set out in Figure 12 are required. The other information is to provide context.

Data recording

When reporting a swap within an investor's portfolio, there are two requirements:

- to adjust the portfolio structure to reflect the sector or sub-sector exposure implicit within the swap; and
- to attribute the performance impact in a way that reflects that exposure.

In order to reflect the sector exposure implicit through the swap within the portfolio structure, a synthetic property is created within the long leg sector (retail for example) with a capital value equal to the notional value. To counter this exposure, a synthetic cash position is created for the short position with a value equal to the inverse notional value. In this way, the initial impact of the swap on portfolio structure is to increase portfolio exposure to the retail sector, without increasing the overall value of the portfolio.

Moving through the life of the swap, the marked-to-market impact is included in the numerator of the total return. This is in order to reflect the fact that as market prices move, a profit or loss can be made by executing the exact inverse trade.

The performance impact from any gains or losses arising from pricing movements or swap cashflows is recorded against the retail sector and also the total portfolio, given that the total portfolio is simply an aggregation of the component sectors.

Performance measurement

In order to quantify these gains and losses, it is necessary to calculate percentage returns, which require numerators and denominators to be generated.

For the numerator of total return, the change in marked-to-market value is added to any swap cashflows – as the total return numerator is ordinarily the movement in capital value plus the net income. However, unlike direct property, or indeed many other types of indirect investment, a swap does not have any capital employed as there is no capital expenditure associated with the acquisition of the contract. It is therefore essentially a 100% geared investment. For performance analysis, this means that IPD is unable to calculate an actual percentage return for the synthetic assets, as it is not possible to calculate a percentage using a zero denominator.

Figure 13 Swap attributes month by month 2009-10

Inputs to IPD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Income received, £m															0.2
Income payable, £m															-1.8
Mark to market value (MTMV), £m				0.0	0.2	0.3	0.7	1.1	1.4	1.8	1.8	2.0	2.1	2.0	0.0
Notional value, £m				10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Notional + MTMV, £m				10.0	10.2	10.3	10.7	11.1	11.4	11.8	11.8	12.0	12.1	12.0	10.0
IPD seg. return, % (shown for reference)												2.2			

Derivative records

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Derivative exposure segment level															
Capital value (nominal exposure)			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Capital expenditure (trans. costs)			0.001												
Net income (received less payable)															2.0
Capital receipts (change in MTMV)					0.1	0.2	0.4	0.3	0.3	0.4	0.0	0.2	0.1	-0.1	-2.0
Synthetic cash portfolio level		-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0				
Synthetic cash segment level												-10.0	-10.0	-10.0	

The absence of an actual return should not be confused with a lack of contribution from the swap, as the cashflows arising from the synthetic property contribute to the numerator of the long leg sector and the overall portfolio, which is then expressed over the capital employed for the direct properties. IPD will therefore report returns for direct property and direct property plus synthetic property, from which the impact of the swap can be observed. Further diagnostic evidence of the sources of this impact can obviously be found with reference to the relevant IPD indices.

Figure 13 shows how swap attributes combine, month by month, to impact the fund's total return. Figure 14 summarises the full year impact of this.

Figure 13 Swap attributes month by month 2009-10 (continued)

Performance and impacts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Derivative numerator	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.3	0.3	0.4	0.0	0.2	0.1	-0.1	0.0
Direct property numerator	-6.3	-6.4	-6.3	-4.3	-2.0	-0.1	1.6	2.2	4.5	7.3	8.0	10.1	5.0	6.3	5.9
Direct property denominator	242.0	233.9	225.9	220.0	216.5	215.0	215.1	215.9	218.9	224.6	231.0	239.4	242.9	247.8	252.3
Direct total return %	-2.6	-2.8	-2.8	-2.0	-0.9	0.0	0.7	1.0	2.1	3.2	3.5	4.2	2.1	2.5	2.4
Combined portfolio numerator	-6.3	-6.4	-6.3	-4.3	-1.9	0.0	2.0	2.6	4.8	7.7	8.0	10.3	5.1	6.2	6.0
Combined portfolio denominator	242.0	233.9	225.9	220.0	216.5	215.0	215.1	215.9	218.9	224.6	231.0	239.4	242.9	247.8	252.3
Combined portfolio															
Total return %	-2.6	-2.8	-2.8	-2.0	-0.9	0.0	0.9	1.2	2.2	3.4	3.5	4.3	2.1	2.5	2.4
Impact of swap %	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.0	0.1	0.0	0.0	0.0

Figure 14 Summary of total return performance 2009 (%)

Direct property	3.4
Swap	4.3
Impact of swap	0.9

Note that as of the end of December 2009, the swap contract matures and exposure to the retail index ceases. To reflect this, the offsetting synthetic cash exposure switches from the portfolio level to the retail segment level for the final three months until contract settlement in March. This results in the retail exposure reverting to that of the physical property holdings only. At the end of the swap, the value of both the long and short positions is zero and the portfolio structure returns to that of the underlying direct properties.

Net swap cashflows arising from the difference between the fixed price and the total return on the IPD index are coded as income. In the derivatives market place, the annual swap cashflows are paid in March in the UK, after the release of the IPD UK Annual Index for the previous year. For this reason, the swap leg payment or receipt can only be recorded in March. Although this may seem to impact the timing of returns, much of the performance associated with this payment would already have been incorporated into the marked-to-market valuation by the end of the calendar year.

The worked example above assumes that the investor has taken a long retail position. Had the contract been a short position and the investor paid the retail index in return for a fixed percentage, the same methodology would apply, except that the synthetic retail property would be negatively valued, while the synthetic cash would be positive. Marked-to-market impact and swap cashflows would be attributed to the synthetic retail property in order that the performance impact of the swap is shown against the sector containing the reference index.

Had the illustrative swap referenced the All Property Index, it would not have been possible to allocate the resulting exposure to a single sector. Instead, an unattributed synthetic property would have been created², adding to the total property exposure of the portfolio. If necessary, it would be possible to allocate the All Property weightings across the segments in the same proportions as the All Property Index.

Marked-to-market values

The methodology outlined above assumes that the impact of price movement is marked to market. However, IPD acknowledges that no single method exists for calculating marked-to-market values. Additionally, the relative illiquidity in the emerging derivatives market generates indicative rather than definitive pricing, especially for sector and sub-sector trades, and no definitive source of price information exists.

Therefore, at present IPD will accept swap valuations from clients using their principles, provided that the source of the valuation is disclosed. This will allow IPD to monitor the various methods used, and to check that prices used fall within a range consistent with the various providers of indicative market prices.

The above represents IPD's initial methodology for measuring swaps and may need to be modified or specified further as the market grows and develops.

² Unattributed records are created by IPD where indirect property exposure can not be allocated to single sector or segment, e.g. units held in a balanced PUT.

Data requirements

In order to measure the performance of swaps, IPD will require the following data to be supplied for each contract and every measurement period:

- Notional value of the contract
- Marked-to-market valuation (monthly)
 - Source of valuation [in-house, broker, bank, other – please specify]
 - Name of external source if applicable
 - Price (margin) used
 - Date of valuation (expected to be end of reporting period)
- Balancing counterparty payments during reporting period
- Reference indices and price (e.g. all-property / fixed price, retail / fixed price etc)
- Buy (long) or sell (short)
- Tenor / Start date / End date
- Name / Client reference
- Trade date
- Date of contract exit (if applicable)

For further information, visit www.ipd.com or email clientservices@ipd.com.



Investment
Property Forum



Investment Property Forum
New Broad Street House
35 New Broad Street
London EC2M 1NH

Tel: 020 7194 7920
Fax: 020 7194 7921
Email: ipfoffice@ipf.org.uk
www.ipf.org.uk