

# SURREY PENSION FUND

## SYNTHETIC EQUITY

### 1. Introduction

1.1. Synthetic equity (or equity replacement) strategies involve gaining equity exposure through the use of derivative contracts rather than by physically investing in equities. The main methods used to achieve this primarily involve using the following:

- Total return swaps; and
- Equity index futures.

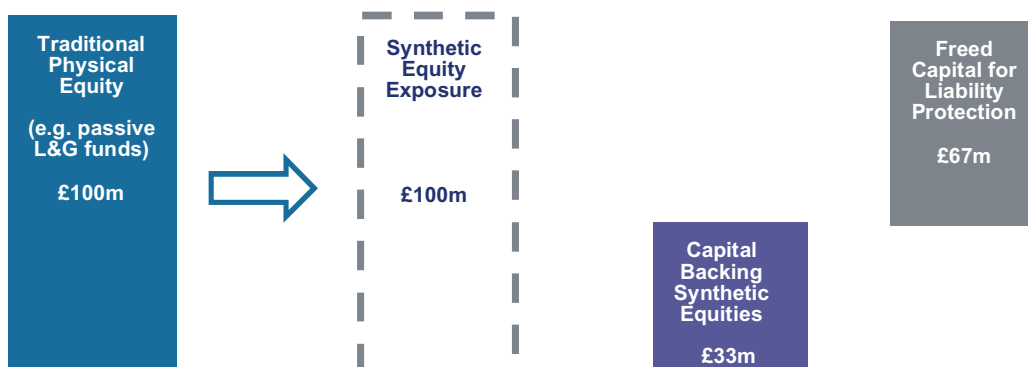
Equity options can also be used and are mentioned in this paper for completeness. In practice though, the above instruments are more likely to be used.

1.2. This paper provides information on “synthetic” equities and the potential opportunities offered by this form of equity exposure which could prove appropriate to the Fund.

1.3. LGPS funds are able to invest in such structures by holding the above mentioned derivatives in bespoke pooled fund structures. We have experience of implementing such a structure for another LGPS fund in the last twelve months. We would also note that the Fund already uses derivative instruments (and has done for some time now) primarily through the currency hedging mandate with Legal & General and within some of the specific investment manager mandates (e.g. the Standard Life GARS Fund makes extensive use of derivatives).

1.4. The key benefit of synthetic equity exposure is that it can free up cash, which can provide liquidity or be used to purchase liability hedging protection elsewhere. The purchase of such protection can occur without seeing a material reduction to equity exposure. This provides the twin benefits of (1) maintaining the expected return on the Fund’s assets and (2) freeing up capital that can be used to help reduce the volatility of the Fund’s deficit, which, as we have illustrated in the investment review, is significant .

1.5. The diagram below shows how a traditional (physical) asset allocation can be substituted for an asset allocation containing more physical bond or cash assets and synthetic equity exposure.



- 1.6. The equity market exposure provided on a “synthetic” basis can be considered to be effectively the same as that achieved via an index-tracking mandate (i.e. the returns captured would be expected to be in line with an index). Given that the Fund has a material part of its equity assets managed on an index-tracking basis, this part of the portfolio would be the logical source of assets for a synthetic equity structure.
- 1.7. This paper provides a high level overview of the key terms associated with derivative investments and the different methods by which synthetic equity exposure can be achieved.
- 1.8. We do not cover implementation in this paper. If the Fund wanted to implement a synthetic equity solution, an investment manager would be needed to manage the derivative contracts as well as some of the proceeds realised by the sales of physical equities. One of the Fund’s existing managers, for example, Legal & General, is likely to be able to manage such a mandate, although it would also be sensible to consider other potential candidates (if required). The actual choice of which derivative instrument should be used would depend on a number of issues (e.g. prevailing market conditions, pricing etc) and would need to be based on clear advice which Mercer would be able to provide.

### Glossary of Key Terms

**Derivative:** Financial instrument, the value of which is dependent on the value of an underlying index, asset or currency.

Includes futures, forwards, options and swaps

**Future:** contract to buy or sell an asset at an agreed price at a specified date in the future. Traded on an organised exchange.

**Forward:** contract to buy or sell an asset at an agreed price at a specified date in the future. Traded directly with a bank counterparty.

**Option:** contract gives the holder the right, but not the obligation, to buy or sell an asset at a certain price on or before a certain date.

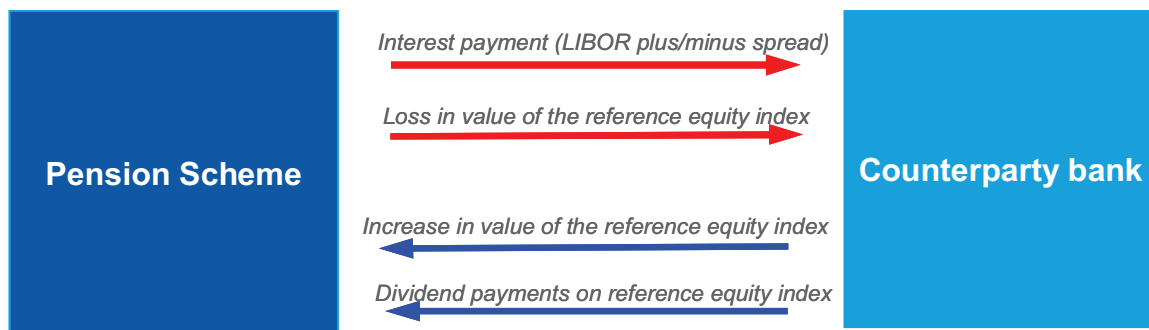
**Swap:** contract to exchange the cash flows or returns from one asset for cash flows or returns from another.

## 2. Equity replacement strategies

- 2.1. Having sold physical equities, derivative contracts can be employed to re-introduce equity exposure whilst retaining the majority of the cash proceeds (some cash will need to be posted as security against the derivative contracts).
- 2.2. There are a range of alternatives available through which this equity exposure may be achieved, the main ones being total return swaps, equity index futures and equity options.
- 2.3. The common feature of these derivatives is that they enable the Fund to gain equity exposure synthetically, in exchange for payment of an interest rate which can be earned on the physical assets realised from the sale of physical equities.

## Equity Total Return Swap

2.4. An equity index total return swap can be illustrated as follows:



2.5. The variable (or floating) interest rate payable is generally determined by reference to either the 3 month or the 6 month London Interbank Offer Rate ("LIBOR").

2.6. The "reference asset" can be based on any equity index agreed with a counterparty bank. Then, under a Total Return Swap contract, the counterparty bank pays all dividend payments on the reference asset, plus any capital gains (positive price changes to the index) over the payment period to the Fund. The Fund pays LIBOR plus/minus a spread as well as any negative price changes to the index.

## Equity Futures and Forwards

2.7. Futures are economically very similar to total return swaps. They are standardised contracts under which one party agrees to buy an asset at a set price at some specified future maturity date. The future price is a function of the current asset price, the current rate of interest and dividend yields. In this case, the asset is an equity index such as FTSE 100 or the S&P 500. Buying futures on such an equity index gives exposure to the performance of that equity index since the futures price will usually move closely in line with the actual level of the index.

2.8. Futures typically have maturities of up to 3 months and therefore require the manager to "roll" the futures on a regular basis. By adopting a rolling futures strategy, under which the investment manager sells futures which are close to the maturity date and buys newly issued longer-dated futures, an investor can gain exposure to the equity index performance without having to physically hold the underlying equities.

2.9. The pricing of both equity index futures and forwards is very similar. The distinction between futures and forwards is important only from an operational perspective (documentation, counterparty risk management etc).

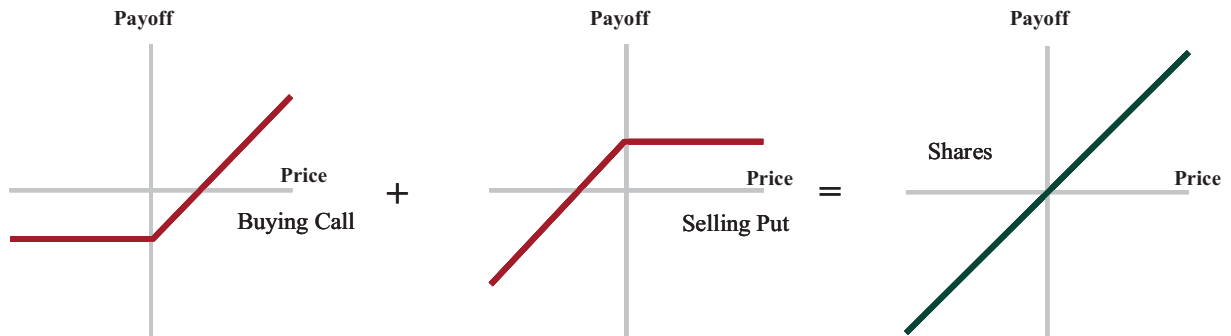
2.10. In terms of income there are two important differences between buying the future or forward contract and holding the physical assets:

- The buyer of the future or forward contract does not have to "fund" his exposure so they can earn interest on the cash which would have been spent by the buyer of the underlying physical asset.
- However, the buyer of the underlying physical equities will receive any dividends due during the term of the contract.

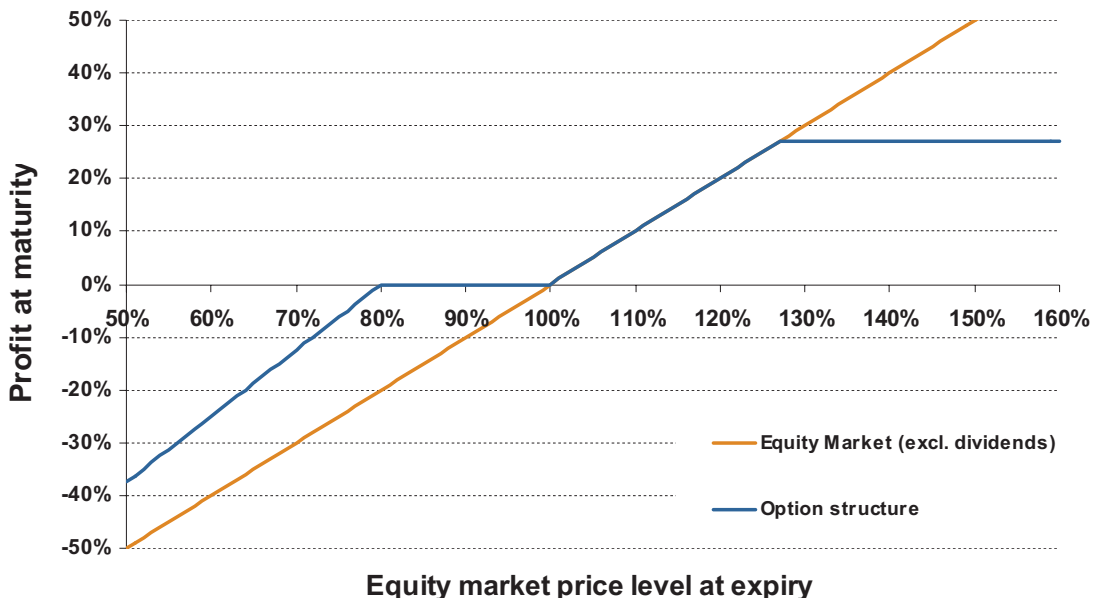
2.11. In practical terms, equity futures (and usually forwards) are "cash settled", so the buyer pays (or receives) the difference between the level of the index at maturity and the agreed "forward" price. In other words, the assets themselves are not usually exchanged.

### Equity Options

- 2.12. An alternative approach to gaining equity exposure synthetically is to use an equity option strategy.
- 2.13. A call option gives the holder the right to buy at a specified price at some point in the future, while a put option gives the holder the right to sell the associated asset for a specified amount.
- 2.14. The Fund would buy or write a combination of call (the right to buy an equity index at a predetermined price in the future) and put (the right to sell an equity index at a predetermined price in the future) options. The predetermined price/level at which the right to buy or sell is set is known as the option "Strike". An option is described as "in the money" if it would result in a pay out if it could be exercised at the current market price. A call option is "in the money" if the underlying price exceeds the strike price while a put option is "in the money" if the underlying price is less than the strike price.
- 2.15. By buying the call option the investor will have exposure to rising markets and the selling of the put option exposes an investor to falling markets. The net result is similar to holding equities on an outright basis as illustrated by the diagrams below:



- 2.16. One advantage of using equity options is that they can be used to change the pay-off profile of the equity portfolio.
- 2.17. A traditional collar is a common strategy which uses options to limit downside risk. Such a strategy provides the Fund's equity portfolio with a degree of downside protection, in return for forgoing upside beyond a certain level; which enables the Fund to lock in an equity return within a known range. This strategy is shown diagrammatically below:



- 2.18. In the above example the Fund would be protected against negative equity market falls equal to 20%. However, any subsequent equity index falls (in excess of this amount) would impact on the Fund's returns.
- 2.19. In addition, the Fund would limit the upside potential of the equity portfolio. The premium received from the sale of this upside, would be used to pay the premium for the protection on the downside. This would mean that the strategy would be implemented at zero-cost to the Fund.
- 2.20. A "collar" structure might be expected to be broadly symmetrical around the 100% price level but in practice the downside risk can be more significant than the potential upside. Protecting against downside is usually more expensive than sacrificing some upside.
- 2.21. It is generally possible to enter into equity options for much longer maturities than swaps and futures. Buying a call option and selling a put option provides the similar economic exposure to buying the underlying asset outright.

### 3. **Summary**

- 3.1. In summary the main advantages of synthetic equity investment are summarised below:
- Relatively low cost: may be even cheaper than passive management if pricing is close to "fair value";
  - Allows rapid implementation of equity rebalancing or equity sales;
  - Frees up assets for other investment opportunities, in particular for the development of a liability hedging programme;
  - Generally low counterparty risk whether using exchange traded instruments or trading directly with bank counterparties;
  - Futures on major equity indices are among the most liquid financial instruments in existence and transaction costs are therefore low.
- 3.2. As shown in our recent investment strategy analysis, the volatility of the funding level and deficit risk for the Fund is high (as with most LGPS funds). For example, the 3 year deficit risk (1 in 20 probability) was shown to be in the order of £1.1bn. This is primarily due to the fact that the current investment policy provides little protection against liability related risks (i.e. changes in long-term interest rates and inflation expectations). Simply diversifying the assets away from equities will not lead to a meaningful reduction in investment risk relative to the liabilities due to the magnitude and dominance of the liability related risks.
- 3.3. However, the need to maintain an investment policy with a relatively high expected return remains in order to help make-up the deficit and maintain the affordability of the Fund. The key attraction for the Fund of a synthetic equity structure is that it would provide a way of maintaining broadly the same level of equity exposure, whilst freeing up capital to start a liability protection strategy.
- 3.4. Some disadvantages and considerations for using derivative exposure as an alternative to physical investment are outlined below, for further information please see Appendix:
- Futures trading requires cash for variation margining plus initial margin (i.e. collateral);
  - Trading forwards or Total Return Swap may require complex derivative documentation;

- Use of short dated contracts involves “roll” risks and costs whilst contractual terms of longer dated instruments may be less favourable;
  - Limitations on the choice of reference index (for example FTSE 350 is easily traded but FTSE All Share is less so).
- 3.5. Whilst equity index futures, total return swaps and options are economically very similar, there are a number of differences between the approaches of which some are highlighted in this paper.
- 3.6. We would be happy to talk through these issues further with the Fund at a future meeting. Further training could be provided by an investment manager, which we would be happy to help arrange.

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## Appendix

### Risks and differences between Swaps, Futures & Options

Whilst equity index futures, total return swaps and options are economically very similar, there are a number of differences between the approaches:

#### Counterparty

Futures are exchange traded, meaning they are standardised contracts bought and sold over a central exchange. In the same way as the underlying equities, there is a central counterparty to each trade in the form of a clearing house, largely removing the risk of counterparty defaults. In contrast, total return swaps and (most) options are OTC (over the counter) contracts, transacted directly with or between investment banks. This introduces more counterparty risk (reduced by the payment of collateral when losses occur) and also reinvestment risk in the event of counterparty default.

The risk introduced by counterparty default is likely to be less of a concern under an equity total return swap. This is down to the fact that in a scenario where a major counterparty bank were to default (likely to coincide with poorly performing equity markets), the Fund is more likely to owe the counterparty money under the equity swaps, however, under this scenario reinvestment risk still remains.

#### Collateral

Futures contracts will require the Fund to post initial margin irrespective of whether the market has moved. Additionally, as markets move against the Fund further margin payments would be required by the exchange to maintain these positions. By contrast, the total return swaps and equity options require no (or very little) initial collateral but will be marked-to-market on an ongoing basis with collateral required to be posted to cover this exposure.

Another key difference between exchange traded (futures) and OTC (swaps and options) contracts is the types of acceptable collateral. Under exchange traded options the Fund will have to post cash, whereas under OTC it will be dependent on the agreement between the Fund and the counterparty bank, which would typically include cash and gilts or higher-rated corporate bonds.

#### Maturity

Futures typically have maturities of up to 3 months, total return swaps typically have maturities of up to 5 years and options could potentially have maturities of up to 10 years. Using the longest maturity contracts reduces reinvestment risk. Relative attractiveness will also change for different maturities.

#### Currency risk

Futures contracts are only offered in local currency, therefore requiring separate currency hedging arrangements if necessary. Swaps, forwards and options may be tailored to provide equity exposure in the currency required by the Fund and therefore would not require additional currency hedging.

#### Indices covered

It is possible to transact futures on all the major country indices (e.g. S&P500, FTSE100, Eurostoxx50 & Nikkei 225). However, futures do not generally cover global indices and rarely cover smaller companies. Under total return swaps and equity options, more flexibility is available to tailor the exposures to meet the specific requirements.

### **Leverage**

In the context of the Fund, leverage would relate to the use of derivatives to take on greater exposure to markets than would be possible using physical instruments only (i.e. use Total Return Swap to maintain equity exposures whilst selling its existing equity holdings to fund the purchase of index-linked gilts).

Although the introduction of leverage introduces new operational risks (for example the need to maintain adequate cash as collateral) the overall financial risk to the Fund is reduced. This is because the sale of physical equities to fund the purchase of liability matching instruments (index-linked gilts) would reduce the interest rate and inflation risk.

### **Roll Risk**

Future contracts need to be rolled on a frequent basis.

When a Total Return Swap expires, assuming equity exposure is still desired, there is a risk that the terms of entering a new Total Return Swap (or buying physical equities if preferred) will be unfavourable, or potentially in extreme scenarios that new Total Return Swaps or futures are not available at all. These circumstances would point to very poor economic and market conditions prevailing. These risks are hard to quantify, but could lead to transaction costs and “out of market” risks.

### **Concentration risk**

Total Return Swaps are based on quoted indices which have a limited number of constituent companies and a specified allocation to those companies based on market capitalisation. Under such an arrangement the Fund would have no direct exposure to companies outside the index and would lose an element of diversification as a result.