

UNFUNDED HEDGING STRATEGIES: SOME PRACTICAL LESSONS FOR ASSET OWNERS

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ABSTRACT

The UK Pension Protection Fund (PPF) was established in April 2005 to protect the pensions of members of UK private sector defined benefit pension schemes which have insufficient assets and whose corporate sponsor fails. The Fund takes over the pension scheme assets and assumes responsibility for the payment of compensation to the former members of the scheme. At the end of the 2011/12 Financial Year, the Fund had liabilities of £16 billion. Annual growth is anticipated to be £2 billion per year. The PPF has one of the largest unfunded LDI programmes in European pensions using a mixture of swaps, swaptions, gilt repos and total return swaps to closely match its liabilities and those of the schemes that are due to transition into the Fund. In this paper we will first discuss the liability hedging strategy of the Fund and then focus on four particular aspects of the management of unfunded hedging positions that the Fund has dealt with in recent years: namely, the management of collateral, the diversification of manager risk, the management of counterparty risks and the outlook for unfunded LDI programmes following regulatory interventions in response to the global financial crisis.

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1. INTRODUCTION AND SUMMARY

- 1.1 The UK Pension Protection Fund (PPF) was established in April 2005 to protect the pensions of members of UK private sector defined benefit pension schemes which have insufficient assets and whose corporate sponsor fails. The Fund takes over the pension scheme assets and assumes responsibility for the payment of compensation to the former members of the scheme. The PPF is a public corporation led by an independent Board. The PPF is not regulated and does not benefit from an explicit Government guarantee. It is subject to the Pensions Act and is accountable to the UK Parliament.
- 1.2 The PPF covers the risk that the sponsor of an eligible defined benefit pension scheme becomes insolvent, leaving the scheme with **insufficient assets to fund the scheme's benefits**. In such cases, the PPF pays compensation to former members of the scheme. Broadly speaking, where members have reached their retirement age at the insolvency event, compensation is paid based on full scheme benefits, whereas for members under retirement age at insolvency, compensation is based on 90% of scheme benefits and is subject to a cap. The PPF is funded by a levy (£630 million for the 2012/2013 year), the assets of schemes that it takes on and the recoveries it makes from the sponsoring companies whose insolvency event caused a scheme to enter the Fund.

Key facts as at 31 March 2013

- The PPF universe of eligible DB schemes comprises 6,300 pension schemes with 12 million members and aggregate liabilities of £1tn, measured under the basis set in accordance with Section 179 of the Pensions Act 2004.
- 550 pension schemes with, in total, over 150,000 members have transferred to the PPF. An additional 250 schemes with 150,000 members are in a PPF assessment period (during which the scheme is assessed for PPF entry).
- **The PPF's balance sheet has** grown significantly to the point where, as at 31 March 2013, an estimated £13bn of assets are under direct PPF management, with a further £6bn of assets managed by schemes that are in an assessment period.

Table 1.1 Key facts about PPF as at 31st March 2013

- 1.3 The PPF Board has established a Funding Objective to be self-sufficient by 2030, by which time it expects to have experienced the majority of

new claims on the Fund¹. The board has also set a limited appetite for investment risk and balance sheet volatility.

- 1.4 Whilst operating within the constrained risk budget, the investment strategy seeks to (i) exploit the existence of risk premia, including illiquidity premia, of a range of asset classes; (ii) exploit the diversifying effect of holding assets whose price behaviour is driven by different factors, having regard to external claims risks facing the PPF; and (iii) recognise the risk of extreme moves in asset prices, particularly under periods of stress when the usual effects of diversification can break down.
- 1.5 It is also assumed that the future level of interest rates and inflation (used to discount the liabilities) are difficult to predict, with open positions (either long or short, relative to the liabilities) generally providing a poor source of reward for the attendant risk.
- 1.6 Following from the above, the investment portfolio exhibits three main features, namely (i) the attempted elimination of interest rate and inflation risk through the use of hedging assets (principally swaps, swaptions and gilt repos); (ii) the use of a broadly diversified range of return-seeking assets to generate excess returns within strict risk budgetary limits and (iii) the use of downside protection against tail risk events. Implementation of the investment strategy is largely through specialist third party investment managers.
- 1.7 The investment strategy seeks to outperform the liabilities by 1.8% per annum within an aggregate risk budget of 4% balance sheet volatility over a one year period. Apart from a small allocation to tactical positions which might include a deliberate under-hedge, virtually all the risk budget has been applied to return-seeking opportunities within a diversified range of strategies and asset classes.
- 1.8 **A description of the strategy can be found in the PPF's Statement of Investment Principles** available on the PPF website. The broad asset allocation is summarised in Table 1.2. A proportion of the Cash and Bonds is set aside in order to provide collateral backing for the liability hedging overlay.

¹ Note that in the UK defined benefit pension schemes are in decline; no new schemes are starting and many existing schemes are closing to new entrants and to new accruals.

Permitted Asset Class	Strategic Allocation	Tolerance Range	Asset Benchmark Index
Cash and Bonds <ul style="list-style-type: none"> • Cash • UK Gilts • Global Government Bonds Global Aggregate Bonds (including Credit)	70%	65-80%	3 month LIBOR FTSE Gilt All-Stk JP Morgan Government Bond Barclays Global Aggregate Bond
Public Equity	10%	5%-20%	FTSE All-World Index
Alternatives (including Property)	20%	10%-25%	Will vary according to the asset class

Table 1.2: The PPF strategic asset allocation as at November 2012

- 1.9 The growth in the Fund, combined with the adoption of a largely unfunded hedging strategy using swaps, swaptions and Gilt-repos, has led to the PPF building up one of the largest such programmes in European pensions. To date the strategy has paid off in that the Fund has been able to achieve returns that have bettered its liabilities during the worst of the financial crisis. Most notably, the Fund returned 25.2% in the financial year 2012/2013, which was more than sufficient to keep its balance sheet stable when long-dated bond yields fell to historical lows.
- 1.10 This paper draws on the recent experiences of the PPF in managing such an extensive and critical programme of liability-driven investments during a period of growth and market change.
- 1.11 Section 2 describes the recent work the Fund has done to redefine its collateral risk policies. It demonstrates the analysis and systematic approach the Fund has taken to maintain sufficient liquidity against the risks of forced sale of assets to meet collateral calls. It also describes the exercise undertaken to investigate the Fund's appetite for roll-risk

under its Gilt-repo programme, an exercise that enabled the fund to quantify a limit for exposure to these instruments.

- 1.12 Section 3 describes how the Fund is diversifying its manager risk away from a single Liability Driven Investment (LDI) and collateral manager by re-engineering its investment process to incorporate both a second LDI manager with a complementary mandate and an independent manager to maintain collateral efficiencies under a more complex management structure.
- 1.13 Sections 4 and 5 deal with issues that have become more critical following the global financial crisis to funds that access the capital markets through derivative instruments. In Section 4 we discuss the steps that the PPF has taken to manage counterparty risks following the collapse of Lehman Brothers and the more recent ratings downgrades of several counterparty banks, and in Section 5 we discuss the changing landscape for unfunded hedging solutions as a result of regulatory action in response to the global financial crisis. Such actions, including the migration to centrally-cleared trading, may improve the security of unfunded programmes, but will come at a cost and be accompanied by a new set of issues for asset owners.

2. MANAGEMENT OF LIQUIDITY RISK

- 2.1 In its extreme form, liquidity risk is the risk of not having enough assets to meet the **Fund's short-term** liabilities. With compensation amounts currently running at under £500 million per annum for the PPF and assets in excess of £18 billion, this risk is low.
- 2.2 However, in a more benign form, liquidity risk may also include the risk of being forced to sell assets at distressed prices and incur losses. Two such examples apply to the PPF:
 - For institutions with large unfunded liability hedging programmes, such as the PPF, the risk of forced disposal at unfavourable terms is quite a real risk. In the absence of tight control of its liquidity position the PPF could, under a scenario of a sharp increase in interest rates, run out of collateral and be unable to meet its short-term liability without selling out of illiquid assets.
 - Additionally, under its Gilt-repo programme, the PPF is vulnerable should liquidity in the repo market dry up, which could require it to unwind its repo positions at the wrong time and incur losses.
- 2.4 At the PPF the appetite for liquidity risks is minimal and tight controls and rigorous action plans have been put in place to minimise their impact. Controls to manage the risk of running out of collateral are

described in 2.5 and the process to manage the liquidity risk associated with repo transactions is described in 2.6.

2.5 *Ensuring liquidity adequacy*

2.5.1 An LDI programme using unfunded instruments fundamentally changes the nature of the institution's **liabilities** under different economic scenarios. From a balance sheet perspective, an increase in interest rates would have a positive effect for an under-hedged or unmatched pension fund and a neutral impact on the PPF (which has hedged this risk in present value terms using swaps). On the other hand, because the **PPF's** derivative contracts are collateralised, the PPF would in these circumstances have to post a large amount of collateral to its counterparties. Thus the mis-match risk on the balance sheet is replaced in part by a liquidity **risk on the Fund's assets**.

2.5.2 To minimise the risk that the Fund will run out of liquid assets a set of controls and actions plans have been developed.

2.5.3 First, liquid assets are categorised into three tiers:

- The first tier is simply the collateral pool that is managed by the **PPF's collateral manager** and invested in UK government bonds and money market instruments. These assets are immediately available as collateral;
- Tier 2 is the next layer of liquid assets that can be called upon to replenish the collateral pool. It is made up of overseas government bonds which are highly liquid (e.g. US Treasury, German Bunds).
- Tier 3 comprises investment grade credits and developed market equity. These assets can be sold at reasonably short notice to raise liquidity. The other assets are deemed to be too illiquid for the purpose of this plan.

2.5.3 The levels of assets under tiers 1, 2 and 3 are then carefully monitored against tolerance levels on a daily basis by the risk owner in the investment team and reported to the PPF Asset and Liability Committee on a quarterly basis. The levels of tolerance are derived from stress tests that are applied to both the assets and the derivative positions to ensure that there will be enough liquid assets to cover collateral needs even when the mark-to-market value of derivatives is very negative and the value of assets is depressed. Three separate stress tests of increasing severity are applied to each of the three

layers² of available liquid assets. These are illustrated in Chart 2.1 below:

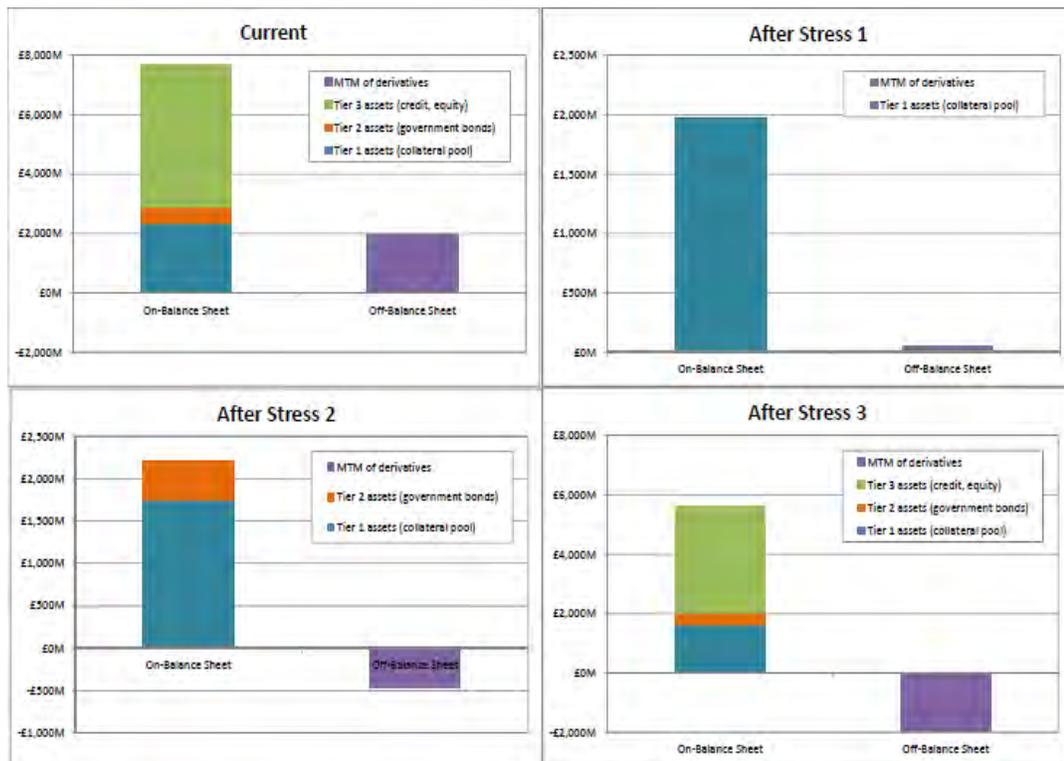


Chart 2.1: PPF liquidity stress tests

2.5.4 If, after any of the three stress tests, the liquidity position becomes negative, an emergency committee is called and a contingency plan to transfer assets to the collateral pool and/or deleverage the balance sheet is initiated.

2.6 Managing Gilt-repo roll risk

2.6.1 The main risk associated with Gilt-repos (which are for much shorter duration than the typical liability profile) is the risk that some or all counterparties may not renew the repurchase agreements and ask for their debt to be paid back. In such a scenario, the Fund may be forced to unwind large amounts of Gilt-repo transactions, sell large amounts of long-dated Gilts at short notice and implement alternative hedging strategies. In circumstances where there is a massive shortage of liquidity in the Gilt-repo market, this activity would be replicated by many other investors at the same time causing even more pressure on the market. This risk is referred to as repo-roll risk.

² Stress tests are expressed as multiples of the historical Expected Shortfall at 99% confidence level over 1 month.

- 2.6.2 At the PPF, repo-roll risk is managed by a combination of pre-emptive actions to limit the risk and its impact, an ongoing monitoring of the liquidity of the repo market itself and a contingency plan to manage a crisis.
- 2.6.3 To monitor the liquidity of the repo market, a dashboard of six market indicators³ has been developed which will help to test the temperature of the market and alert the Fund to conditions which might prove problematical. The dashboard of indicators is given an overall Green, Amber, or Red rating which has been calibrated against historical conditions. A back-test of this monitoring framework shows that, over the last ten years, a Red rating would have been attributed only once, during the period from November 2008 to March 2009.
- 2.6.4 **Under the PPF's approach, an overall Amber or Red rating immediately triggers deployment of a contingency plan.** An emergency committee is called and actions to reduce leverage, or unwind repo transactions or transfer assets to the LDI portfolio are decided and taken over a short period of time (1 month if rating is Amber, 1 week if Red).
- 2.6.5 To limit the impact of a liquidity crisis, a number of investment restrictions have been set:
- The LDI manager is required to stagger the maturities of the repo-transactions. The amount of repo maturing in less than a month is limited, and the manager is required to maintain a cash buffer representing at least 1/3rd of the amount of repo transactions maturing in one month. A cash buffer is a strong mitigation, as it allows unwinding repo transactions without having to sell the Gilts which are pledged against the repo debts.
 - An aggregate limit is also applied to the total amount of Gilt repos and Total Return Swaps that the Fund uses. This was set by estimating the potential losses in an extreme scenario. Under this scenario it was assumed that the PPF would not be able to roll its positions for 6 months, and that during this period the spread between Gilt yields and swap rate would widen by 40 basis points. This level corresponds to the average swap spread over the six-month period that **followed Lehman Brothers' bankruptcy** in 2008. Under this scenario the PPF would be forced to unwind its swap-spread transactions and realise losses.

³ They include four market indicators that may signal stress in the money market, such as the spread between Libor and Treasury Bill rates and the VIX index and the iTraxx cross over index which may indicate tension in the equity and credit markets respectively.

The limit that was set equals the total amount of assets in tier 1 and 2. It would grow with the hedging needs of the PPF and at the same time would ensure that, should a crisis occur, the PPF will always have enough liquid assets to increase the cash buffer and reduce losses to a level which the PPF Investment Committee has established that it is prepared to tolerate.

3. DIVERSIFICATION OF MANAGER RISK

- 3.1 Most asset owners will employ an external LDI manager to execute the unfunded hedging programme either through a pooled vehicle or, for larger mandates, on a segregated portfolio basis. In the latter case, a large fund can build up a high dependency on a single manager that assumes a position of some strategic importance to the Fund's objectives. Despite the evident benefits of a close strategic partnership in a changing financial landscape, this partnership can become a strategic dependency that can be uncomfortable and very difficult to break should the manager underperform or otherwise become unsuitable.
- 3.2 The PPF, in conjunction with its advisers, Redington, recently undertook a ground-breaking project to bring a second LDI manager into play on its portfolio. This involved a redefinition of key processes, the development of independent relationships with a large number of counterparty banks and the creation of a single collateral pool, managed by an independent collateral manager, to preserve the swap mark-to-market netting opportunities under a multiple LDI manager model.
- 3.3 As part of the project a number of key processes needed to be adapted to allow for an operating model with two LDI managers. There were three objectives which needed to be borne into consideration at all points:
 - Reduce reliance on the existing LDI manager **by creating a "warm substitute" in as many operational areas as possible**;
 - Deliver an operating model at least as efficient as the current model; and
 - Minimise any additional or increased operational risks resultant from introducing a second LDI manager.

The key process areas that needed to be redefined in order to introduce a second LDI manager are described in detail in the following sections:

3.4 *The Liability Benchmark Portfolio*

- 3.4.1 The key process to be redefined is the derivation of the Liability Benchmark Portfolio. This is the *investible* asset portfolio that most closely matches the changes in value of the (largely un-investible) benefit outgoings of the PPF.
- 3.4.2 The yearly increases in benefit payments paid by the PPF are linked to CPI, for which there is not a liquid market of matching instruments, so RPI-linked instruments are used instead.
- 3.4.3 Furthermore, the increases in benefit payments each year are subject to caps and floors. Properly hedging these embedded options involves some subtle modelling techniques for which there is not a clear industry standard. During the course of the project the PPF worked in conjunction with Redington to:
- Examine the proposed approaches of the major LDI providers;
 - Define the most market-consistent modelling approach; and
 - Detail the specifics of the calculations such that they are verifiable by a third party using commonly available data sources.
- 3.4.4 Having a precisely defined methodology for this crucial calculation is vital to avoid the risk that each manager will adopt slightly different (but justifiable) modelling assumptions and therefore the ultimate hedging portfolio is inconsistently implemented. Typically the differences found in terms of the calculation methodology stemmed from:
- Different option-pricing models being used to calculate the effect on overall inflation sensitivity of the portfolio from the caps and floors in the benefit structure;
 - Different assumptions with respect to the mapping between RPI inflation modelling and CPI inflation modelling; and
 - Assumption with respect to the timing of cashflow occurrences and lagging of inflation indexation.
- 3.4.5 It is important to address model risk in any such calculation where there is a dependence on modelling assumptions. Models used in financial markets naturally evolve over time and market practice changes. Any model chosen will, by definition, be a simplification of reality, meaning that it is important to put in place a framework for periodically reviewing all key modelling assumptions to make sure they remain consistent with best industry practice.

3.5 *Accrual of the hedging exposure*

3.5.1 As the PPF is, and will continue to be, in a state where its liabilities grow over time as sponsors become insolvent, it is important to have a clear framework for increasing the hedging exposures efficiently through time. The logical outworking of this is an approach where the Liability Benchmark Portfolio accrues through time, at a rate dependent on market conditions.

3.5.2 Bringing the second manager into play necessitated a clearly-articulated process by which each manager would accrue additional hedging exposure, avoiding the risk of putting the managers in competition for the same trades, or of placing one at an informational disadvantage relative to the other.

3.6 *Managing collateral efficiently*

3.6.1 The core activities involved in collateral management are the valuation of all trades, reconciliation and agreement with counterparties of position values and the instruction to call for collateral or respond to a collateral call from a trading counterparty. Typically, most LDI mandates provide collateral management of the swap positions as part of the overall LDI service offering. The benefit of having the LDI manager as collateral manager is that when collateral disputes occur, the LDI manager can make use of the front office communication channels between their trading desk and the **counterparties'** trading desks to help resolve disputes.

3.6.2 When introducing a second LDI manager, it is not desirable to have each manager separately managing collateral and collateralising positions under separate swap legal agreements with each counterparty (see Chart 3.1). This situation is likely to result in inefficient use of collateral. At some stage, it is very likely that the LDI managers will have offsetting negative and positive mark-to-market position against the same counterparty. Under different swap legal agreements, these offsetting mark-to-markets would not net against each other. This approach also results in a division of the collateral pool, meaning that the optimal asset for one manager to post may be held in the collateral pool of the second manager, and vice versa.

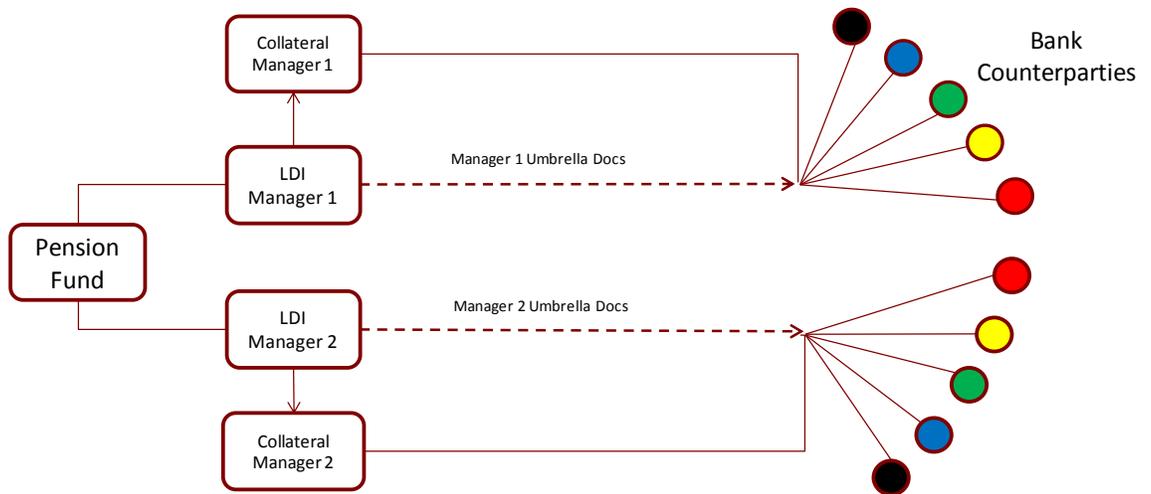


Chart 3.1 Split collateral pool model. Source: Redington

3.6.3 The solution designed to avoid these collateral inefficiencies involved negotiating new legal swap documentation (ISDA, CSA, GMRA) between the PPF and each counterparty, and allowing both LDI managers to transact swaps as Agent for the PPF using these new documents (see Chart 3.2). With both LDI managers transacting swaps under the same legal documentation, it is then possible to put in place a central collateral manager, managing the collateral positions for all trades from one central pool of assets. The collateral manager receives position details from each LDI manager on a daily basis, values the aggregate position across both managers versus each counterparty and then makes and responds to collateral calls based on the aggregate position.

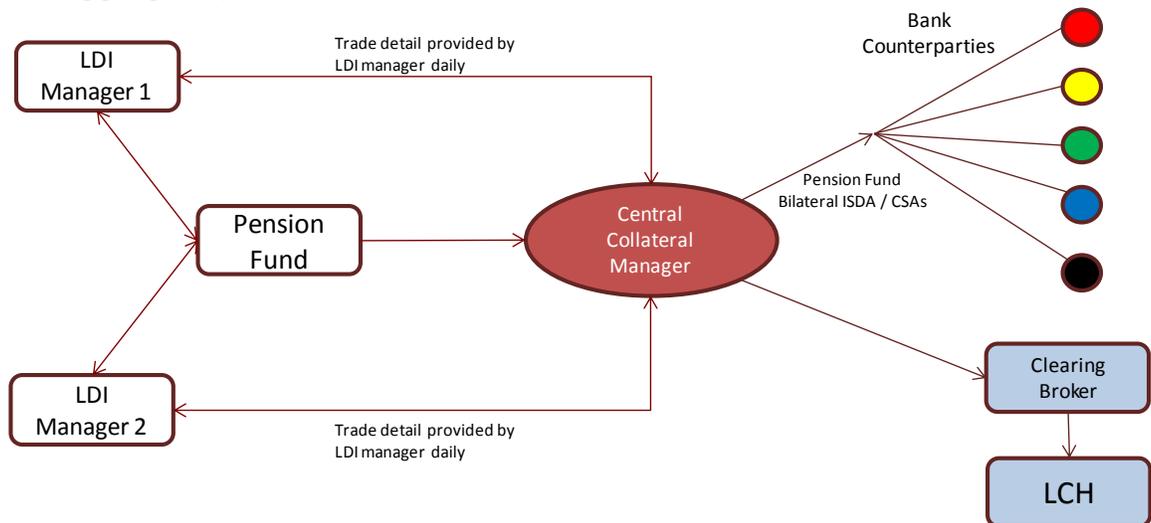


Chart 3.2: Central collateral management model. Source: Redington

3.6.4 This structure is currently not very common among asset owners and presents several operational challenges, particularly in ensuring that both managers can establish the right communication protocols with the new collateral manager and that the valuation capabilities of the collateral manager are sufficient to deal with the range of derivatives being used. However, once implemented, the structure provides increased collateral efficiency and increased transparency of valuation. Collateral processes can also be extended to include other asset managers using derivatives outside of the LDI programme, further increasing overall collateral efficiency.

3.7 *Defining the Second LDI Mandate*

3.7.1 Prior to the change in arrangements **the PPF's portfolio was managed** on an active basis, with permissible instruments including swaps, physical gilts, gilt repo and total return swaps (TRS). Two key questions arose regarding the second mandate:

- Should it be an active or passive mandate?
- What should the range of permissible instruments be?

3.7.2 The risk of introducing a second active manager is that the positioning of the two managers might at some times offset, resulting in active fees being paid for a passive portfolio. Introducing a second active manager also increases the burden of monitoring the success of the **second manager's trading views. The decision was taken that the** second mandate would be passive, with small risk allowances around a central benchmark to allow for efficient portfolio management.

3.7.3 Setting the second manager up to allow the full range of permissible **instruments is the only way an effective "warm sub" can be created,** but the complexity of the required asset transition is greatly increased by splitting all of the exposures to different instruments between the two managers. A compromise position was settled upon, setting up the required documents and reporting processes for the second manager to trade the full range of assets, after verification of their capability in all relevant areas, but restricting the initial mandate to cover only the more straightforward instruments such as fixed interest and inflation swaps.

3.8 *Defining Risk Parameters and Monitoring the Liability Benchmark Portfolio*

3.8.1 As individual LDI managers will have subtle differences in the way they measure and report on risks, to get a true aggregated and consistent view it was essential to pin down the methodology precisely. This involved defining the key sensitivities (with respect to nominal rates,

inflation and swap spreads) that would be monitored, understanding the subtle differences in how different LDI managers would typically calculate and report on them and then defining a consistent framework for reporting.

- 3.8.2 With a single manager the restrictions in terms of deviations from the benchmark positions for that individual manager are, by definition, identical to the restrictions at an overall level. This is not the case with two managers, so careful thought is needed to develop a consistent framework to allow each manager some deviation from the benchmark while also maintaining a consistent view on the total portfolio risk parameters. It is important to note that, even for a passive mandate, some deviation from the benchmark is necessary for efficient portfolio management and to avoid excessive trading.

4. MANAGING COUNTERPARTY RISK

4.1 *Introduction*

- 4.1.1 The collapse of Lehman Brothers in 2008 was the first major risk incident for unfunded hedging strategies, and was a wake-up call to asset owners regarding the risks of transferring interest rate and inflation sensitivity risk onto the capital markets through a derivatives programme. More recently, downgrades of banks by ratings agencies have caused asset owners to rethink their counterparty risk policies to prevent a concentration of risk.
- 4.1.2 This section examines (within the limits of commercial confidentiality) how the PPF sought to recalibrate its counterparty risk policies within the framework of its negotiations over individual ISDAs and CSAs under the project described in Section 3. Practical advice from this experience is passed on where possible.
- 4.1.3 The overriding conclusion to be drawn is the importance of a disciplined, focused and clear approach to both commercial and legal issues throughout.
- 4.1.4 As part of the project to implement a second LDI manager for the PPF, there was a need to negotiate new swap legal documentation (ISDAs, CSAs and GMRAs) with bank counterparties. The existing swap legal documentation could not be used by the second Agent (i.e. the second LDI manager) and the objective central collateral management model required both LDI managers to transact swaps using the same set of legal agreements in order to deliver the intended netting of swap mark-to-markets across counterparties.

4.2 *ISDA – additional termination events*

- 4.2.1 The most important clause in an ISDA from a credit risk mitigation standpoint is the credit rating Additional Termination Event (ATE). The credit rating ATE allows the PPF to novate trades away from a counterparty that has suffered a deterioration in credit rating, with the downgraded counterparty covering the costs of the novation. Banks' attitudes to these triggers have changed significantly since 2008, and there is now greater reluctance to agree to credit ratings-based ATEs. However, this clause is an important credit mitigant for derivative users, particularly given the recent downward trend in credit ratings of the major investment banks.
- 4.2.2 However, credit rating ATEs are not a panacea to the issue of counterparty risk, particularly given credit ratings agencies have tended to be reactive rather than proactive, adjusting credit ratings in the wake of market events, sometimes after it is too late. For example, a credit rating ATE at A-/A3 would have provided no risk mitigation in the default of Lehman Brothers, since the bank 'jumped to default' when still rated above this level.
- 4.2.3 A high credit rating ATE reduces **a counterparty's 'jump-to-default'** window and provides protection if a counterparty progresses down through the credit ratings before moving to default.
- 4.2.4 **As well as reducing the 'jump-to-default' window, a high credit rating** ATE provides the option to terminate trades upon downgrade of a counterparty without needing to consider the cost implications. In **many cases, terminating trades is seen as a 'nuclear option',** which may not be required, but the ability to do so can provide negotiating leverage to secure other forms of credit mitigation such as an Independent Amount (additional amount of collateral provided by the downgraded counterparty).
- 4.2.5 It should be noted that, in the future, banks may need to set aside capital to provide for the potential costs they would incur were a client to terminate using a credit rating ATE. If counterparties do start provisioning for ATE costs, they may need to pass that cost onto swap end users, increasing the cost of trading with counterparties once they come within a certain number of ratings notches of the credit rating ATEs specified in the ISDA.
- 4.2.6 The role of the LDI manager will be to monitor trading costs and make clients aware of any bank pricing which starts incorporating capital provisions costs. At this point, the client can weigh up the costs and benefits the ATE trigger provides to mitigate counterparty credit risk, and decide whether or not to remove the term from their swap documentation.

4.3 Credit support annex (CSA)

- 4.3.1 The Credit Support Annex (CSA) is a side agreement to the ISDA which sets out the agreed terms for the movement of collateral between counterparties to meet changes in the value of any outstanding swaps. The most important element of the CSA is the type (and currency) of the assets which are eligible as collateral.
- 4.3.2 Some CSAs provide for a wide range of assets which can be posted as collateral, including corporate bonds, supranational debt, government bonds and cash not denominated in the base currency of the agreement. Including these additional assets provides added flexibility to post a variety of assets as collateral.
- 4.3.3 However, on an ongoing basis, the inclusion of corporate bonds and non-base currency assets as eligible collateral in the CSA introduces an element of subjectivity into swap valuation which becomes troublesome when restructuring, recouping or unwinding swaps before the specified end date of the swap. This ambiguity in the swap value makes portfolio management more difficult and introduces basis risks which create the potential for the swap value to deviate from the performance of the liability which it is intended to hedge.
- 4.3.4 The basis risk stems from the fact that the market standard for discounting swap cashflows now depends on the eligible collateral that can be posted under the CSA. When assets in multiple currencies can be posted, the value of the swap becomes dependent on the movement of the basis of those various funding curves (for example Eonia for Euro assets, Fed Funds for US Dollar assets and Sonia for Sterling assets). The risk is that there is a big movement in one of these funding curves, resulting in a deviation in the swap value and the value of the liability which is intended to be hedged.

4.4 Consistency of terms

- 4.4.1 The overriding principle during the exercise to negotiate new swap legal documentation for the PPF was consistency. Consistency of terms was targeted across each of the legal documents (ISDA, CSA and GMRA) to make the trading terms fair across all counterparties, to remove possible incentives to trade with one counterparty above another and to provide any advantage to one counterparty above another.
- 4.4.2 Consistency of terms also allows the PPF to novate trades between counterparties without incurring costs due to different capital treatment or subjectivity of valuation.

- 4.4.3 Finally, when maintaining a large number of counterparty relationships, consistency makes it easier for PPF team members to be cognisant of the legal position on a specific issue against all counterparties, without needing to reference individual documents or remember specific terms for each counterparty.

5. UNFUNDED HEDGING STRATEGIES AFTER THE GLOBAL FINANCIAL CRISIS

5.1 *Implications of the G20 summit, September 2009*

5.1.1 Newly alert to the systemic risk to the financial system hitherto locked away within the over the counter derivatives market, leaders of the G20 nations have resolved to set in motion regulatory moves to limit such risks. In the US this impulse has manifested itself in the Dodd-Frank Act and in the EU with the EMIR directive, in both cases forcing a wide range of derivative transactions onto centrally-cleared platforms in order to reduce perceived risks.

5.1.2 Other regulatory measures that aim to increase bank capital requirements and impose costly margin requirements on un-cleared trades are also well-advanced.

5.1.3 The implications for asset owners are both strategic and operational. Increased costs of unfunded hedging strategies reduce the return potential from these strategies (albeit with much reduced risk) and may require a re-balancing of the mix of funded and unfunded hedges in a portfolio.

5.1.4 Alternatively, asset owners may seek more synthetic exposure to return-seeking assets or to trade more derivatives with non-financial counterparties. On the operational front, the prospect of centrally-cleared trading establishes a new operating model, new relationships and new risks and contingencies to which asset owners must become alert.

5.2 *Cost of central clearing*

5.2.1 There are two main costs of central clearing.

5.2.2 The first of these is the introduction of initial margin. Initial margin is an additional amount of collateral that is required for centrally-cleared trades and can only be posted in cash or government bonds. The purpose of initial margin is to mitigate gap risk (cover any losses which arise following the default of a counterparty until swap exposure can be replaced). Additional collateral reduces the potential for leverage in an LDI strategy. The risk of requiring swap users to hold additional

collateral is that other assets are pushed into riskier investments to maintain the required returns of the Scheme.

5.2.3 The second main cost of central clearing is the requirement to provide cash as variation margin. OTC swaps are collateralised under a CSA and usually cash, gilts and sometimes other government bonds can be posted as collateral. Pension funds typically hold gilts as part of their strategic asset allocation, meaning that gilt collateral is usually readily available. However, cash is usually only held in small amounts in order to meet benefit payments. Any increase in the amount of cash required to be held would direct assets away from the return seeking investments.

5.3 *Liquidity pressures*

5.3.1 As alluded to in Section 2 of this paper, liquidity is playing an **increasingly central role in asset owners' investment strategies**. In particular, where unfunded implementation is preferred, liquidity and collateral cannot be ignored. Furthermore, on the asset side, where a strategic decision has been made to take exposure to investments offering illiquidity risk premia, the right balance needs to be struck between increasing returns and ensuring there are enough liquid assets to avoid ever becoming a forced seller in an adverse market scenario.

5.4 *Benefits of central clearing*

5.4.1 One of the benefits of central clearing is a reduction in the number of counterparties. Central clearing means moving from facing many banks to facing just one (or more) central clearing counterparties. By collapsing down the number of counterparty linkages, offsetting mark-to-market positions against different counterparties net against each other and the total collateral requirement of a swap portfolio reduces significantly in many cases.

5.4.2 The benefits are felt both in terms of collateral posted and collateral received. Collateral posted reduces, releasing capital to be invested in higher-yielding return-seeking assets, if necessary. Collateral received also reduces; a particularly welcome benefit given that netting down of mark-to-market is always a better credit mitigant than holding collateral.

5.4.3 The benefits of netting will be particularly noticeable where the LDI manager has had an active mandate. In most active LDI mandates the manager will have the ability to trade pay fixed swaps (typically one would expect an LDI manager attempting to hedge liabilities to purchase received fixed swaps). The pay fixed swaps will usually be **part of 'alpha' generating trades such as** asset swaps, curve positions,

or inflation hedging trades where an index linked gilt is purchased and the fixed coupon swapped out to isolate the RPI exposure (synthetic breakeven). Central clearing will reduce the problem of trapped collateral across counterparties by offsetting any pay fixed and receive fixed swap under one collateral call from the clearing house.

5.4.4 The added benefit of clearing is that in many ways a clearing house represents a more secure counterparty than an investment bank. Clearing houses have a number of measures in place which mean they are better placed to deal with the default of a clearing member. These include the requirement to provide initial margin, the ability to port trades from a clearing member in the event of a default and the default waterfall which is used to cover losses.

5.4.5 **In the case of the Lehman's default, cleared trades which** Lehman defaulted on did not require the default waterfall, and only 35% of the **initial margin which Lehman's had posted was needed to cover** investor losses. For OTC trades which Lehman defaulted on, some counterparties are still waiting to be made whole and are unlikely to ever recoup their full losses. Any asset owner concerned about the potential credit worthiness of a counterparty bank in the future should give themselves the option of a counterparty upgrade by having the ability to novate trades away from that counterparty to a central clearing counterparty.

5.5 *Bank capital requirements*

5.5.1 Given the stated aim of regulators to push the market towards central clearing, the added concern is that this will be incentivised by making it less attractive for banks to make markets in non-cleared swaps. This could be achieved by introducing more onerous capital requirements for OTC trades relative to cleared trades and could cause liquidity to move from the OTC market to the cleared market. Any increased capital costs of non-cleared trades may ultimately be passed on to end users.

5.6 *Option to clear*

5.7 We conclude that asset owners should be well-prepared for the introduction of clearing, even if their intention is to keep trades outside of it in order to avoid the additional costs of initial margin and cash variation margin. Putting in place the agreements and processes which allow the potential to clear provides an option which can be taken if clearing does become an attractive proposition. Having the option is more beneficial than not having the option, even if the full benefits and costs continue to remain uncertain for the time being.

6 SUMMARY AND CONCLUSION

- 6.1 For asset owners with investment objectives that are driven by their liabilities, unfunded hedging programmes can be excellent ways in which mismatching risks can be controlled without losing the potential to outperform by tying up too much capital in the process. However the strategies are complex and involve access to and reliance on the capital markets at a time of considerable change and challenge.
- 6.2 This paper has taken a brief look at four separate issues – liquidity management, manager concentration risk, counterparty risk management and the emerging regulatory landscape – and described the processes and emerging strategies of a major liability driven investor.
- 6.3 The intention is that the implementation of the structure described in this paper will lay the foundation upon which the evolving PPF unfunded hedging strategy can be built. The structure has been designed to allow the inclusion of additional managers in the liability benchmark sharing and collateral management processes, providing the possibility that a third LDI manager could be added in the future to further diversify manager concentration. Additionally, the PPF has the option to centrally manage the collateral of any other asset managers who are making use of unfunded implementation strategies.
- 6.4 There are other additional benefits provided by the structure, such as the ability to instruct directed trades across multiple funds managers.
- 6.5 The new LDI operating model has also provided greater understanding and transparency of key processes to the PPF. This will assist in the knowledge transfer to the PPF and increase the potential for elements of the process to be taken in-house in the future.
- 6.6 As the world recovers from the global financial crisis and markets and regulators adjust to a new environment, hedging strategies will undoubtedly evolve as participants seek to make use of new and existing capital resources to optimise the beneficial effects of good liability-driven disciplines. At best therefore, the paper describes a major **“work in progress”**. **But the authors of this paper sincerely hope** that their advice and lessons will be of assistance to others in their own journeys through this changing landscape.