P-Solve
ASSET SOLUTIONS

London Borough of Hammersmith & Fulham Pension Fund

Review of Investment Objectives and Strategy

This paper is addressed to the Audit & Pensions Committee ("the Committee") of the London Borough of Hammersmith & Fulham Pension Fund ("the Fund"). The purpose of this paper is to consider the following issues:

- The appropriateness of the current investment objective and, within this:
  - Reviewing the current Liability Benchmark Portfolio (the "LBP", the liability-related objective for the investment strategy) in light of updated liability information
  - Reviewing the outperformance target based on the recently agreed funding plan.
- Considering the ability of the current investment strategy to achieve the objective and the risks associated with the current investment strategy.
- Introducing potential changes that could be made to the current investment strategy.

Our advice to the Committee is summarised below:

Objective	**How much return do we need?**	The Minimum Required Return from the 2007 valuation was 1.75% in excess of the liability-related objective (the LBP). At the 2010 valuation, the Minimum Required Return has been increased to 2.2% p.a. in excess of the risk free rate. **Proposal: The Committee should amend their investment objective for governance monitoring purposes.**
	Is the current LBP appropriate?	The Committee previously adopted a LBP that comprised a portfolio of index linked gilts broadly representative of the profile of the Fund's liabilities. Following completion of the 2010 valuation, the LBP has been updated to reflect current liability information. **Proposal: The Committee should update the LBP used for governance monitoring purposes.**

Risk allocation	**Can the current strategy achieve the objective?**	The current investment strategy targets a return in excess of the Minimum Required Return and is expected to achieve its target under various economic scenarios. However, there remain large sources of risk, predominantly from exposure to equity markets. **Proposal: Maintain broad strategy but consider how to diversify returns further.**
Risk Management	**Is the management of the exposure to economic regime change appropriate?**	As mentioned above, the Fund remains exposed to equity markets as a principal source of return and, as such, is exposed to the risks associated with these markets and a diminution arising from a shift to a lower growth environment. Increasing exposure to assets that do not rely on economic growth factors as a principal source of return is therefore attractive. **Proposal: Introduce an allocation to alternatives by reducing the equity allocation. Consider the governance mechanisms through which such an allocation could be managed.**
	Is the management of liability risk appropriate?	The Fund retains significant exposure to liability risk although this is presently being addressed through the development of the LGIM Matching Fund mandate. Once implemented, consideration could be given as to how the influence of this mandate could be extended. **Proposal: Continue with the implementation of the LGIM mandate as a mechanism for mitigating liability risk. Once implemented, consider how the mandate could be evolved.**
	Are there other opportunities for risk management?	Whilst the use of alternative assets could reduce the volatility of asset returns, further steps could be taken to protect the Fund against equity market falls through the use of derivatives. It is possible that this could be achieved through the new LGIM mandate. **Proposal: Although no immediate changes are proposed to the investment strategy, P-Solve will work with LGIM to explore the mechanics of introducing equity market protection.**

We look forward to discussing this paper with the Committee at their next meeting.

P-Solve Asset Solutions

August 2011

1.0 Where are we now?

The Committee have adopted an investment strategy as set out below.

Asset Class	Manager	Benchmark	Current Allocation (%)	Strategic Allocation (%)
UK Equities	Majedie	FTSE All Share + 2% p.a.	26.7	25.0
Global Equities	MFS	FTSE World ex UK + 2% p.a.	26.9	25.0
DAA	Barings/Ruffer	Libor + 4% p.a.	25.1	25.0
Matching Fund	GSAM/LGIM	Over 15 year IL Gilts +1%	21.0	25.0
Cash			0.3	0.0
Total			**100.0**	**100.0**

The objective of the investment strategy is to deliver a return of at least LBP + 1.75% p.a. where the LBP is defined as a portfolio of gilts representative of the Fund's liabilities and the outperformance target is the level of return in excess of the risk free rate assumed within the 2007 valuation.

However, the strategy employed targets a return somewhat above this.

2.0 Updating the Liability Benchmark Portfolio

The funding level of the Fund is affected by both the assets and the liabilities. As a result, the performance of Fund's assets should not be looked at in isolation but instead should be considered in comparison to the liabilities. The investment strategy has been designed to diversify the assets, seeking to generate a stable return. In conjunction with the liability hedging arrangement, the overall performance of the strategy should beat the growth in the liabilities.

But how do we effectively govern this on an ongoing basis? Whilst we address the question of governance in a little more detail as an Appendix to this note, measuring the performance of the assets directly against the liabilities would be cumbersome and costly. It is therefore simpler to measure the performance of the assets against a liability proxy. We call this the Liability Benchmark Portfolio ("LBP").

Put simply, the LBP is the portfolio of assets that best matches the liabilities and could be considered as the portfolio of assets that the Scheme would invest in to fully match the liabilities if it had the assets to do so.

The LBP is usually an "investible" benchmark, made up of a combination of bonds (typically gilts) or cash and swaps. Although the LBP is not intended to be an exact replica of the liabilities, as it cannot take into account membership movements, it aims to capture the effect of changes in market conditions on the liability value e.g. changes in interest rates and inflation. The LBP therefore provides an appropriate and realistic benchmark for the performance of the Fund's overall investment strategy.

To date, the Committee have used a LBP that has been defined by reference to a bespoke portfolio of index linked gilts. This was determined following completion of the 2007 valuation. Given the 2010 valuation has recently been completed, updated liability information can be used to construct a more up to date LBP.

2.1 What characteristics should the LBP have?

The LBP effectively provides a bridge between the calculation of the liabilities and the investment of the assets. It is desirable that the LBP meet a number of different criteria:

2.1.1 It should be representative of the manner in which the liabilities are calculated

The Scheme Actuary has defined a methodology for calculating the basis underlying the Technical provisions. For the Scheme, this relies on the yields on certain gilt indices which are used to derive both an estimate of future price inflation and a suitable discount rate. It is therefore desirable that the LBP be determined in a similar way, using gilts and/or gilt indices. This is the current basis for the LBP.

2.1.2 It should capture as accurately as possible the underlying nature of the liabilities

Gilt indices do not typically reflect the distribution of risk within a pension scheme. Whilst it is possible to capture the split between nominal and inflationary liabilities, capturing the duration and shape of the liabilities using only gilt indices is more problematic. Given the role of the LBP is to reflect the movement in liability values, it is preferable that these characteristics are represented within the LBP. It is therefore proposed that the LBP is constructed in a bespoke manner, using individual gilts.

2.1.3 It should be investible

Whilst it is possible to construct theoretically accurate portfolios that capture quite precisely the changes in liability values, such solutions can be over-engineered and overly complex for the purpose for which they have been created. Further, such solutions may make use of instruments for which a "market value" is not directly obtainable.

Given the role of the LBP is to help aid governance, it is desirable that the proposed LBP be constructed using investments that the Fund can invest in and for which the performance of the Fund can then be easily calculated.

2.1.4 It should be aligned with the Fund's investments

One of the roles of the LBP is to govern the investment strategy. It is therefore appropriate that the manner in which the liabilities are calculated to change is directly replicated by movements in asset values.

For the Fund, this would mean the value of the assets (particularly the assets devoted to liability risk management) being linked to changing gilt prices. Changes to the Matching Fund and the mechanism for the management of liability risk are currently in progress.

2.2 Proposed LBP

The purpose of the LBP is to provide a measureable proxy for the Fund's liabilities against which the investment strategy can be benchmarked and managed. The LBP is intended to capture the impact of changing financial conditions – inflation expectations and interest rates – on the liabilities of the Fund. In this respect, there are three factors that are relevant, in order of importance:

- The split between fixed and inflation linked liabilities, reflecting the way in which the Fund's benefits increase. It is noted that LGPS liabilities are wholly inflationary in nature, being linked to increases in CPI. However, as there are currently no assets that provide a direct link to CPI, index linked gilts that are linked to RPI are used as a proxy.

- The average term to payment or duration of the liabilities. Duration measures the overall sensitivity to changes in interest rates/inflation.

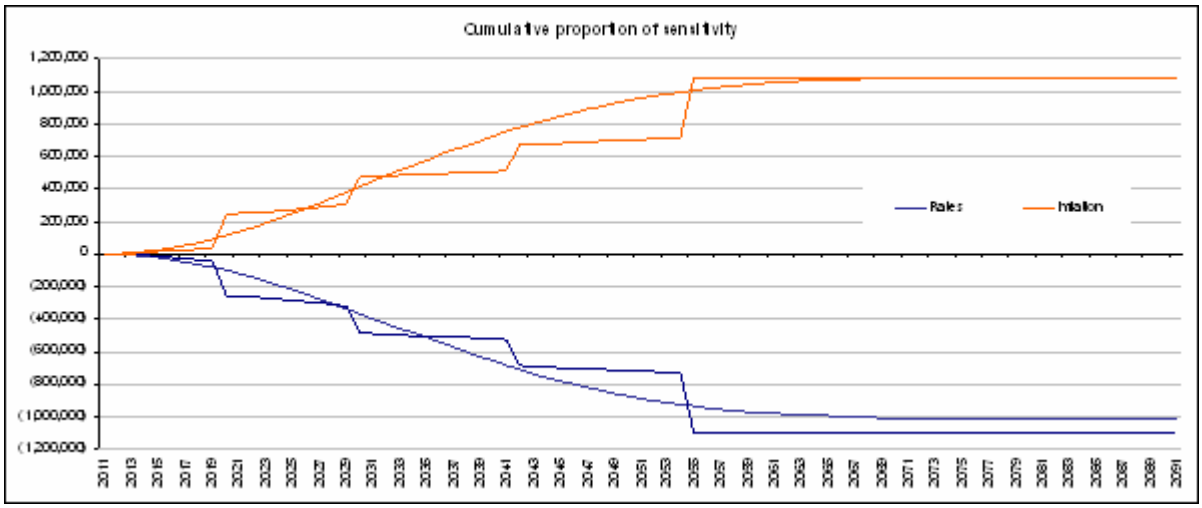
- The "shape" of the liabilities. Changes in interest rates/inflation expectations at different terms can have a differing impact on liability values.

In specifying a revised LBP, we are not seeking to precisely replicate the liability cashflows, rather capture the various characteristics set out above as accurately and as simply as possible. We therefore propose the following LBP be adopted by the Committee for ongoing governance purposes:

	2010	2007
1¼% Index-linked Treasury Gilt 2017	45%	-
2½% Index-linked Treasury Gilt 2024	-	27%
1¼% Index-linked Treasury Gilt 2027	20%	63%
1 1/8% Index-linked Treasury Gilt 2037	10%	-
0¾% Index-linked Treasury Gilt 2047	5%	-
1¼% Index-linked Treasury Gilt 2055	20%	10%
	100%	**100%**

2.3 Suitability of Proposed LBP

The suitability of the proposed LBP can be considered by comparing the sensitivity of the liabilities to a change in interest rates/inflation and comparing the corresponding change in the LBP. This is illustrated in the chart below.



The chart shows how much additional risk is added for each additional year of liability cashflow. What can be noted from the above is that the Scheme is relatively mature with little additional risk beyond the 2055 point. The cumulative risk profile of the LBP tracks the cumulative risk profile of the liabilities reasonably well. However, as the LBP is being used primarily as a proxy for governance reporting purposes, we are satisfied that the LBP is appropriate.

3.0 Outperformance objective

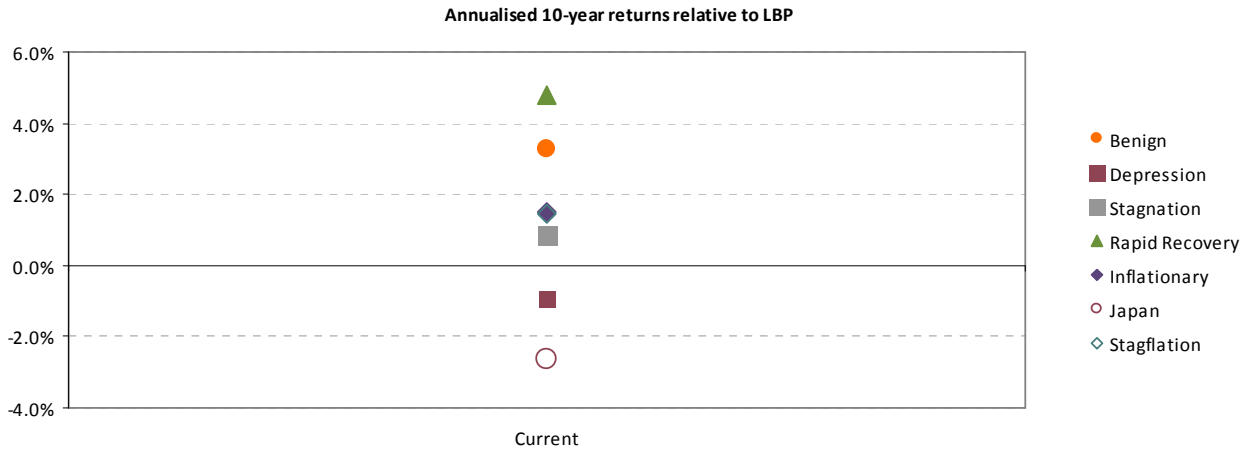
The Fund's investments need to earn a return in excess of the risk free rate in order for the funding position to "stand still". The valuation assumed that investments would achieve a return of 6.7% p.a. or 2.2% p.a. in excess of the return on gilts.

The Recovery Plan has also been set by reference to these assumptions and, should the return be in line with that assumed, then the contributions payable will remove the deficit over the 25 year period agreed.

Taking account of experience since the valuation, it is estimated that a slightly higher return than that assumed at the valuation date would be needed to achieve the target of being fully funded by 2035. However, given experience represents shorter term market volatility and the valuation adopted a smoothed asset valuation, the Committee should align their performance objective with the long term assumptions in the Recovery Plan.

As a minimum therefore, the investment strategy needs to achieve a return of at least 2.2% p.a. in excess of the risk free rate over the next 25 years. This is known as the Minimum Required Return (MRR). The current strategy targets a return in excess of this (approximately 2.5% p.a. before consideration of active management). However, for monitoring purposes, we propose the Committee continue to monitor the performance of the strategy against the MRR; this will allow the Committee to judge when their strategy is being successful and narrowing the funding deficit.

Consideration also needs to be given as to whether the current strategy is likely to achieve this. Whilst risk is explored further in Section 4, the chart below considers the potential for the current strategy to achieve its target return over the next ten years under a number of different economic scenarios. These scenarios are explained in the Appendix.



We see that under scenarios that carry low levels of economic growth (Japan, Depression, Stagnation), the strategy falls behind the 2.2% p.a. outperformance target. More optimistic scenarios will see the strategy meet its target return.

The analysis above does not make any allowance for any manager outperformance, relying instead on a static asset allocation. Given the current strategy employs managers who seek to deliver both stock and rotational outperformance, the expected returns from the strategy are likely to be higher, if this outperformance is achieved.

4.0 Introduction to risk

Risk is the potential for loss. What that "loss" is depends on the specific circumstances of the investor. For example, it may be that for a pension plan to improve the funding level, the assets need to grow at a rate of gilts + 2% per annum. The definition of risk is then related to the gilts + 2% threshold, as falling below this would mean the funding level falling.

So in considering risk, we need to have some benchmark compared to which we can evaluate the risk of loss. But what represents a loss? To start thinking about this, let's look at some of the biggest losses in history and see if this tells us something.

- The biggest daily equity market crash was 23% (October 1987). It would take a return of 30% to come back from that.
- We've seen losses of around 50% in equity markets in the space of a year. This is worse, as we need to double our money to get back to where we started.
- But the worst ever developed equity market fall (peak to trough and where the equity market survived) occurred between 1929 and 1932, when the US equity market fell by around 85%. This is a completely different order of magnitude as a problem as to recover requires a return of over 560%.

So we should be worried about losses that occur over longer periods of time. But can we say more about what caused the most severe losses? By examining historic losses in markets, there are some important themes that emerge:

- Biggest losses combine overvaluation and economic regime change
- Where overvaluation and economic regime change occurs, losses take longer to recoup (i.e. they are more "permanent")
- Where losses result from financial stress without overvaluation, markets tend to come back more quickly.

This leads us to an important principle. We believe strongly that risk should be first viewed as "the potential for permanent capital loss, rather than price variation". Markets will wobble, but it's the loss you don't expect to re-coup quickly that causes the real problems. This is not to say that price variation is never an issue – for an institution, failure to manage the effect of price variation on asset values can lead to issues around the pace of funding. But the biggest "risk" is the permanent capital loss, so this should be our primary focus, with managing price variation secondary.

The biggest sources of "permanent loss" are market overvaluation and economic regime change. Financial stress alone tends to be more like price variation, in that markets tend to come back relatively quickly.

In addition to all of this, there is normal price variation – or volatility – which results in "losses" of a lower order of magnitude. Markets also tend to bounce back quickly from losses arising from normal volatility alone.

We believe that it is the timeframe over which losses are recovered that distinguishes between different forms of risk. The table below summarises how we think about risk:

Risk Type	Typical Loss level	Typical Recovery Time	Description
Normal market volatility	Low: up to 10%	A few months	This is the risk (if it is considered a risk) that results from normal price variation in markets. Markets will ebb and flow in the process of rising and there will be periods when markets fall even in reasonably stable conditions.
Market shock/stress	Medium: 20% - 50%	Months to a year	From time to time, markets become subject to stresses, which can push down further than might be expected in normal market conditions.
"Permanent" loss, often over a prolonged period	High: 50% +	Years	This risk generally relates to market overvaluation, but is also caused, or significantly worsened, when coupled with economic regime change (which is generally precipitated by an asset bubble) or a change to the underlying fundamental factors.

Regular Market Volatility can be measured using a VaR ("Value at Risk") type model which can estimate the expected volatility of the strategy in normal market conditions. We generally propose that Market Stress is measured by

calculating the effect on the funding level of one off market shocks e.g. a sharp fall in equity values or a significant rise in inflation. To measure the risk of permanent loss, we think of a range of economic scenarios and project how the strategy would perform in each of these situations.

When examining the return/risk of the portfolios we may propose, it is these return/risk measures that we return to, to compare the value of making a change in strategy.

4.1 Developing a Risk Benchmark

Using the current investment strategy as a base, we determine the level of risk currently being run using the various measures set out above. We consider each in turn.

4.1.1 Normal market volatility

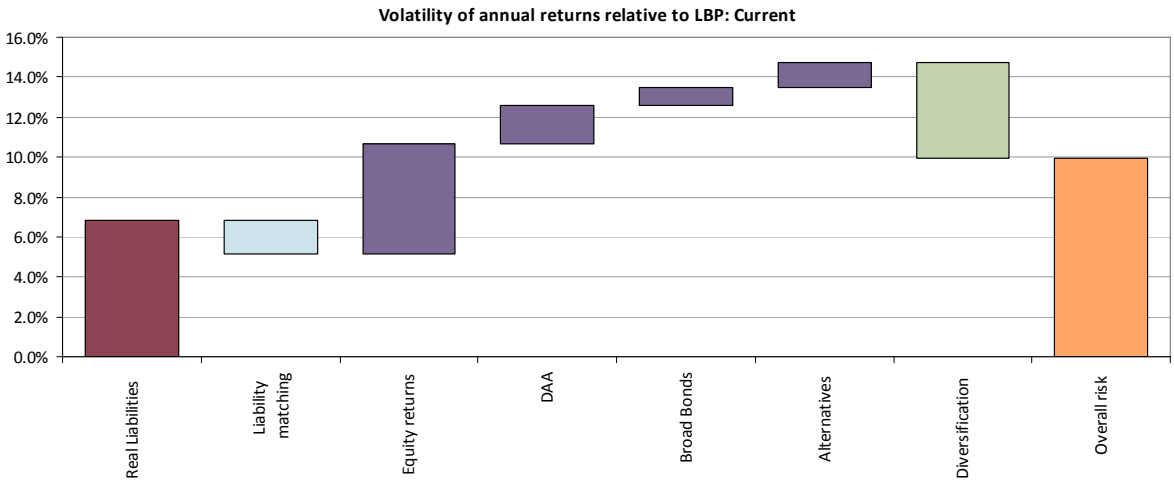
Risk can be tested in a normal manner by considering the volatility of returns (i.e. the potential range of returns that would arise two years in every three). The results of this assessment are shown below:

	Current
Volatility	10%

To explain the volatility numbers; the current strategy targets a return of around LBP+2.5% p.a. With a volatility of 10% p.a., this means that the Committee can expect returns to fall in the range of LBP – 2.5% to LBP + 7.5% two years in every three. One year in six, returns could be expected to be greater than LBP+7.5%. One year in six, returns could be expected to be below LBP – 2.5%.

Compared to an equity only strategy (which would show a volatility of around 16% p.a.), this demonstrates the Fund is running a more conservative strategy. However, it is worth considering further just how the various risks faced within the Fund break down.

The chart below shows the various sources of risk in the current arrangements:



Risk can be split between liability risks and asset risks:

- We know that the liabilities are inherently volatile, with both interest rates and inflation being sources of risk (purple bar).

- The Committee has agreed to implement a Matching Fund arrangement which seeks to mitigate a proportion of the Fund's interest rate risk and inflation risk. This serves to reduce liability risk (light blue bar).
- Additional contributions to risk are created from the various return seeking mandates within the strategy, i.e. equity, DAA and Broad Bonds (purple bars). These return-seeking allocations benefit from diversification (green bar).

This picture demonstrates that equity exposure remains a very significant contributor to overall risk.

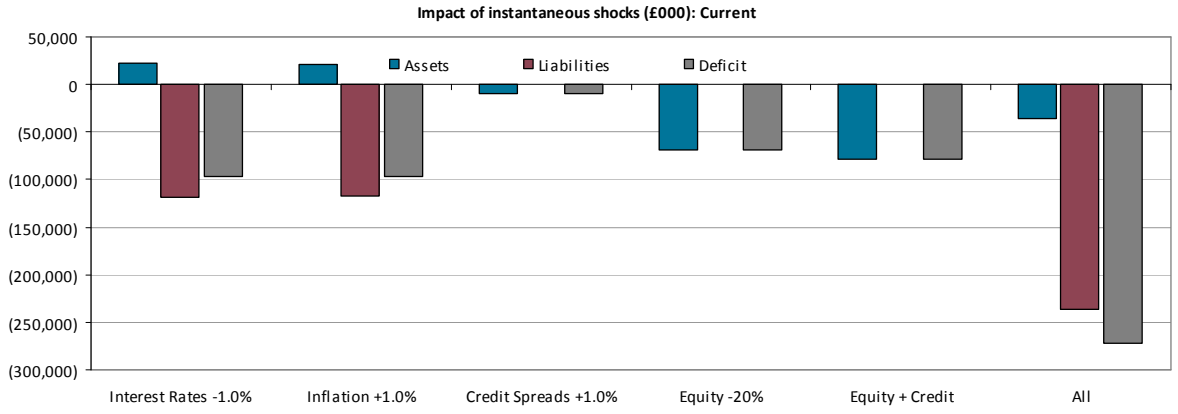
4.1.2 Market shock/stress

We can test the potential for loss from the investment strategy by considering the impact on the Fund deficit of an instantaneous shock to markets. There are four key factors to consider: interest rates, inflation, equity markets and credit spreads (the excess yield over government bonds for taking corporate risk). To illustrate conditions when market shocks have arisen, the table below considers when markets were last subject to some of these stresses:

Shock event	Last occurrence	Recovery period
Interest rates fall by 1% (30 year rates)	09/08 to 12/08	Five months
Inflation expectations rise by 1% (30 year rates)	01/07 to 09/08	Not yet
Credit spreads widen by 1% (AA bonds)	09/08 to 10/08	Three months
Equity markets fall by 20% (UK equity market)	01/09 to 03/09	Two months

Market shocks can be more or less severe and, although they may not all occur simultaneously as factors such as interest rate and inflation movements are correlated, considering the combined impact of each of these shocks as well as their individual impact offers a basis for comparison.

The chart below shows the Fund's current exposure to shocks.



To comment on the chart above:

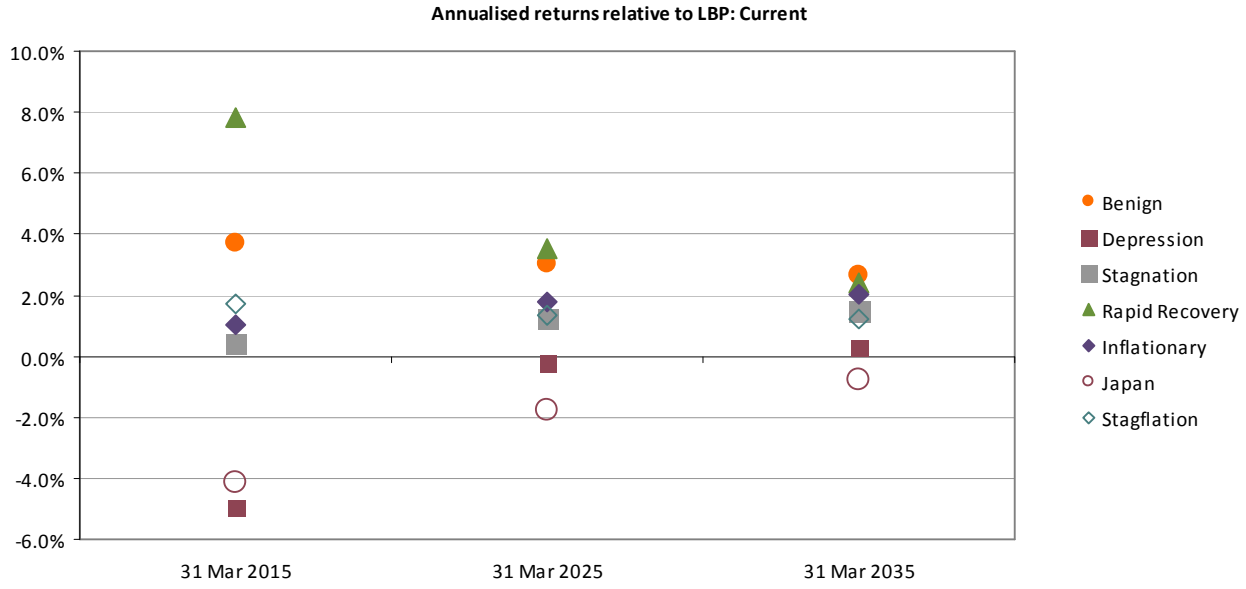
- Given the long-term nature of the liabilities, it is a fall in long-term interest rates and/or an increase in long-term inflation expectations that would be most problematic for the Fund. For example, long-term interest rates are presently around 4% p.a. Whilst it is possible that interest rates will fall (in a scenario similar to that experienced in Japan over the last 20 years), P-Solve believe it more likely that interest rates will rise from present levels (which would have the beneficial impact of reducing the value of the Fund's liabilities and thus improving overall funding measures).

- Exposure to asset risk remains relatively high, with a fall in equity markets of 20% likely to increase the deficit by around £70 million.

4.1.3 Permanent Loss

The risk of a permanent loss of capital can be considered by examining the performance of the strategy under different long-term economic scenarios. The chart below shows the performance potential relative to the Liability Benchmark Portfolio (LBP) of the strategy over different time horizons. Risk can be measured by reference to the dispersion of outcomes.

Further detail on the economics scenarios used is set out in the Appendix. But if we consider the returns that may arise over various periods from 31 March 2011 under each of the seven scenarios, we see the following:



- The current strategy will underperform significantly under the Japan scenario. In this scenario, interest rates will fall (from current levels) meaning that the value of liabilities will increase significantly. Under such a scenario, the value of the Matching Fund would increase, but this would be more than offset by the increase in the value of the liabilities and the fall in the value of risky assets. It is worth reiterating that as interest rates are at historically low levels, P-Solve perceive the chance of rates rising over time is higher than them falling further, although we acknowledge that this may not happen quickly.
- Under scenarios that see little economic growth (depression, stagnation), risky assets perform poorly over shorter time horizons before recovering over the longer term. Under these scenarios the current strategy is predicted to perform slightly behind, the growth in the liabilities.
- Under an inflationary scenario, although asset returns are expected to be beneficial, returns from the strategy would be held back (relative to the LBP) by the inflationary growth in liability values.
- More optimistic scenarios see returns from the strategy above target although one contributing factor is the expected increase in interest rates under many of these scenarios.

We also note again that none of the scenarios provide advanced credit for successful active management, either via stock selection or rotation, which the Fund has benefited from up to this point. Furthermore, our selected scenarios cover a range of plausible outcomes, rather than the full range of possibilities. If (for example) interest rates were to

rise faster or further than anticipated, the relative performance of the Fund is likely to be better than that shown in many of the scenarios above.

4.2 Summary of Risk Benchmark

By considering the riskiness of the investment strategy in the different manners set out above, the Committee can build up a more complete picture of the risks faced by the Fund. We believe this approach to be preferable to considering risk as a single number. The combined results of this analysis can be used as a risk benchmark against which other investment strategies can be compared.

It should be remembered that the analysis set out above is based on the assumption of a static investment strategy and any additional return and risk control that is generated (or losses that are prevented) through rotation into/out of asset classes over time together with any performance generated by other active management is not reflected. The investment strategy incorporates various mandates that incorporate risk control of this nature, including the Barings DAA Fund and the Ruffer Fund. Both mandates have the ability to vary asset allocation over time, particularly by reference to the longer term nature of pension scheme investment.

What is evident however from the analysis above is that the Fund remains susceptible to equity market volatility and equity market underperformance will result in the Fund failing to meet its objectives. Consideration should therefore be given to further diversifying the Fund's investment strategy away from equity markets.

5.0 Proposed changes to the current investment strategy

As highlighted in the risk analysis, the main asset risk to which the Fund is susceptible is equity risk. There are three principal ways in which the strategy can be changed to reduce the risk associated with equity market investment:

- Diversification: investing in another asset class that offers similar return potential;
- Rotation: employing an investment manager to disinvest from equity markets when the potential for further returns is low and to invest back in equity markets when the potential for further returns increases;
- Insurance: introducing mechanisms which limit the loss from equity exposure when markets fall.

The Committee introduced an allocation to Dynamic Asset Allocation mandates which uses rotation as a source of risk control. We propose the Committee consider both the further Diversification of their equity allocation through the introduction of a dedicated allocation to Alternative investments and also explore the potential "insurance" of the equity allocation through a Structured Equity mandate.

We explore the merits of an allocation to Alternative investments below and comment briefly on Structured Equity.

5.1 Alternatives

The Fund currently has some exposure to alternative investments, through the Private Equity allocations managed by Invesco and Unigestion and separately through the Majedie Tortoise Fund, an equity long/short hedge fund that is incorporated within the UK equity allocation. The Barings and Ruffer DAA vehicles also make limited use of alternative investments.

However, in total, these assets have a value of around £25 million, representing around 3% of total Fund assets. The diversification benefits gained from the use of alternatives is therefore limited and consideration can be given to expanding the use of alternatives.

The most important reason for investing in alternatives is because we should believe there are higher and/or more diverse returns available. The return arguments are relatively straightforward:

- More muted economic growth in developed markets makes seeking alternative sources of return more important.
- Early stage growth opportunities have for some years tended to be illiquid anyway.
- Diversification by return driver is becoming more important – many are hard to access directly other than through alternatives (see below).
- The greater availability of capital in private markets is leading to a need for institutions to think about competing for return. This results partly from the progressive de-listing of capital markets, and partly because of the rise of private financing deals going forward. In addition, shortage of capital (eg in bank lending) is generating opportunities for private capital.

In terms of return drivers, we believe there are ten underlying broad factors that drive the long term return (and risk) of investments. These are shown in the table below.

Driver	Why
Scarcity	Some resources are finite (oil, precious metals), others are unique (artwork). Both offer the potential for return as scarcity drives up prices.
Population Growth	Availability of more people to provide services/goods
GDP per Capita	People working harder/more efficiently increases productivity
Dependency Ratio	Changes in the ratio of workers to dependents can contribute to growth
Savings Ratio	The balance between spending on consumption now and investment to generate future growth (and consumption)
Attractors	Unnecessary spending. Branded items, luxury goods, trophy assets
Risk Transfer	A return premium exists as some are willing to pay extra to insure against unexpected/large losses.
Subsidy	Governments offer targeted return incentives to encourage desired market activity or behaviour, giving exposure to public sector policy stability.
Innovation	Changing behaviours through thought/product development
Alpha/Arbitrage	Return can be generated through the application of skill (intellectual capital) and the exploitation of information.

Of these factors, four essentially make up economic growth, to which the majority of listed assets are exposed. The other factors, however, tend to be significantly less pronounced, if represented at all, in traditional portfolios of listed assets. An alternatives portfolio allows these to be expressed more effectively.

5.1.2 What do we mean by Alternatives?

There is a very wide range of investments that can be considered as "alternative". However, more simplistically they can be thought of as covering three different types of investment, as shown in the table below.

Broad type	Description	Examples
Traditional illiquid	Assets that pension schemes or institutions have held traditionally but that are illiquid in nature	▪ Private equity ▪ Private debt (e.g. loans) ▪ Property
Non-Traditional "liquid"	Assets that pension schemes have typically not used significantly but that is relatively easy to trade	▪ Commodities ▪ Non-traditional active management strategies (e.g. Hedge Funds) ▪ Carbon-credits

		▪ Shipping
Non-traditional or emerging illiquid	Assets that pension schemes have typically not used significantly and that are also illiquid. These include opportunities that are more recent to emerge	▪ Wine/art etc ▪ Insurance linked securities ▪ Intellectual capital

Although the Committee could choose to pursue investment in one of these assets, we believe consideration should be given to pursuing broader access to such investments.

5.1.3 Gaining access to Alternatives

P-Solve believe there are three governance models through which an allocation to Alternative investments could be introduced and managed. These are summarised below:

- **Pure advice-based**: This is where each individual strategy and manager is reviewed by the Committee. The Committee retains responsibility for ongoing review of the allocation to different alternatives mandates and the suitability of the managers employed.
- **Delegated**: In this situation, the Committee gives the responsibility for determining the allocation to various alternatives, and the selection of managers to implement this to a third party. This could be achieved through the investment in an alternatives fund or via the creation of a tailored/segregated portfolio of investments.
- **Alternatives partner**: In this instance, a specialist is appointed to advise the Committee on alternatives strategy, but where the Committee makes the final decision on what types of alternatives it is comfortable with and the overall allocation to each. The alternatives specialist is then appointed to determine which managers should be used for each alternatives sector (eg private equity, debt, etc).

The Committee presently pursue an advice based approach, having undertaken a selection exercise to appoint a Private Equity manager. However, the Committee have also accepted that their ability to more actively manage the Fund's asset allocation is limited and may therefore have a preference for a partner based/delegated approach.

5.1.4 The potential benefits from investment in Alternatives

We consider the impact on the risk profile of the Fund of introducing a 10% allocation to Alternatives, funded by a reduction in equity exposure as detailed below.

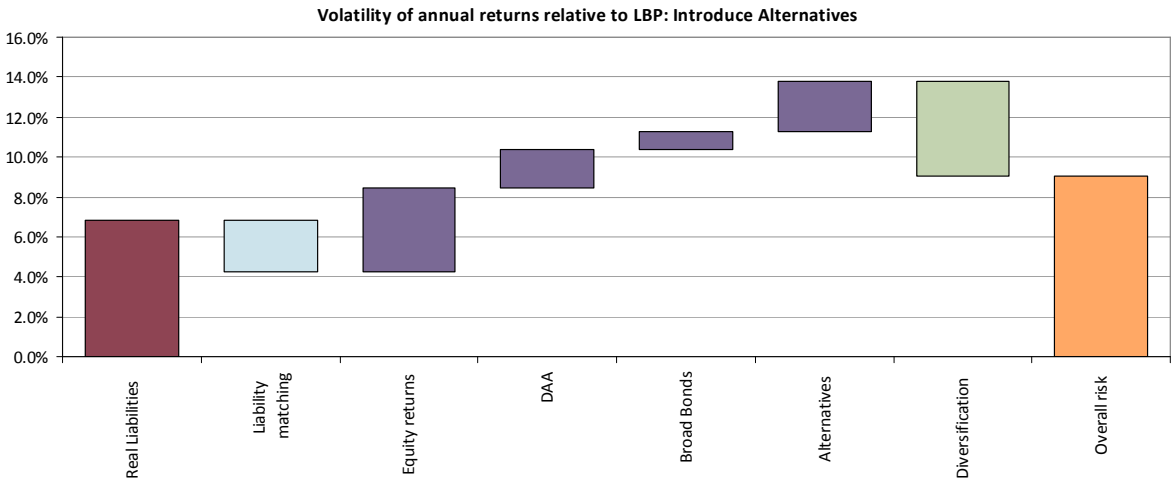
	Current	Proposed
Equity	50%	40%
DAA	25%	25%
Matching Fund	25%	25%
Alternatives	-	10%

Using the same approach to the assessment of risk as set out in section 4, introducing an allocation to alternatives is expected to reduce the overall volatility of returns as illustrated below:

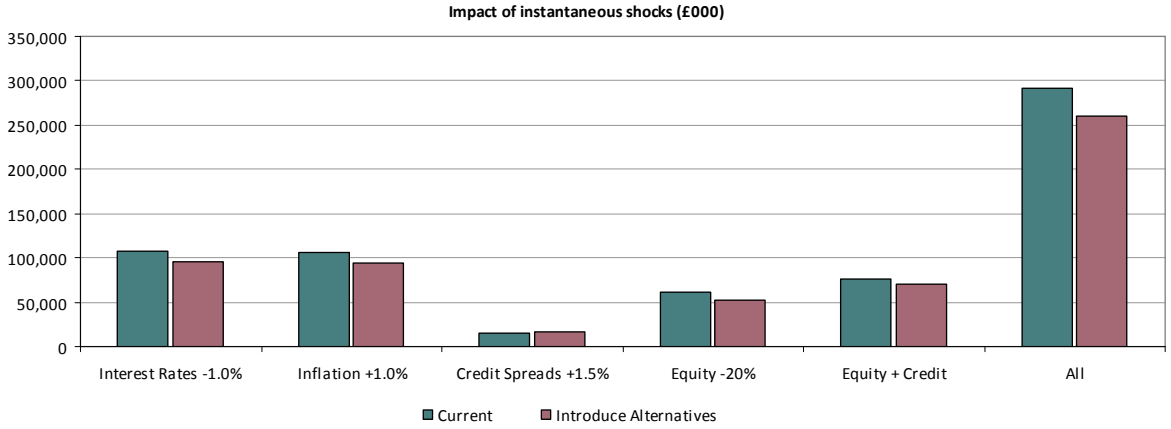
We can first calculate the expected volatility of returns under the revised strategy:

	Current	Proposed
Volatility	10%	9%

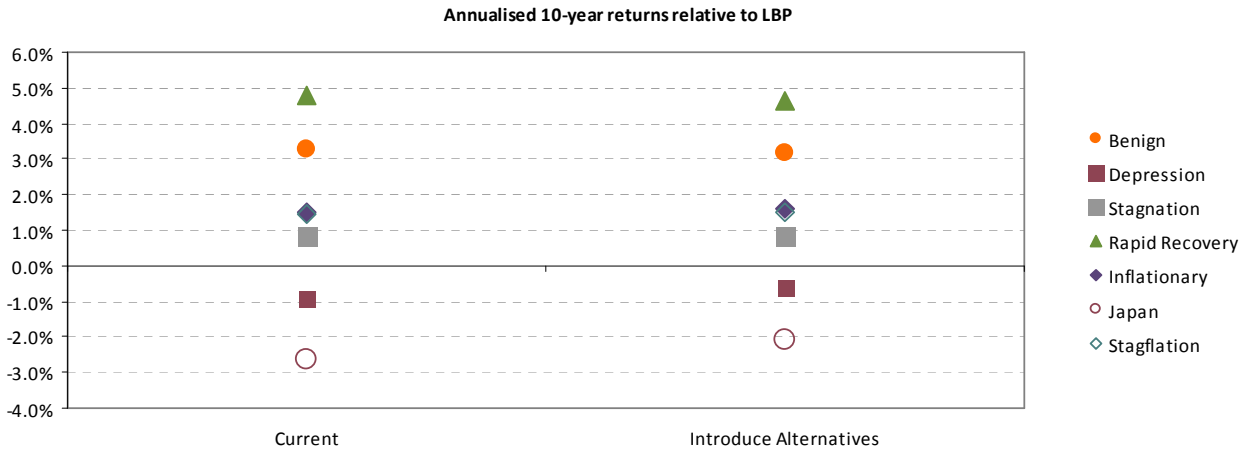
As illustrated in the chart below, the contribution of equity returns to overall volatility is reduced.



Removing equity exposure in favour of uncorrelated assets also reduces the overall exposure to market shocks. The exact risks faced by the Fund would depend on the underlying alternative investment(s) made.



Introducing alternatives is expected to reduce the dispersion of returns under the scenarios considered, i.e. the Fund is expected to be less exposed to asset classes that rely on continued economic growth.

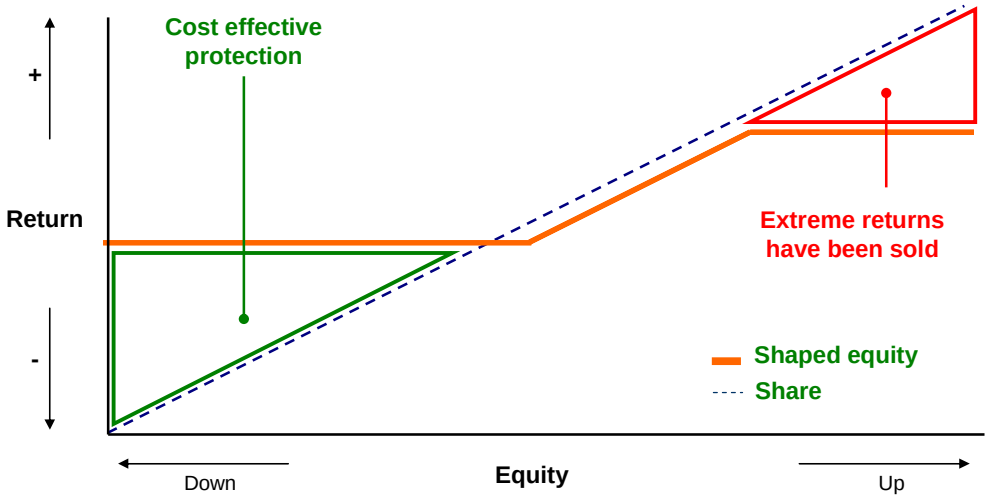


5.1.5 Proposed action

The use of Alternative investments can reduce risk and increase the overall long-term certainty of returns. Given the barriers facing economic growth, particularly in the Developed World, we recommend the Committee agree to explore the merits of introducing an allocation to Alternative investments and the mechanisms by which this could be managed.

5.2 Structured Equity

Investors can use derivatives to "structure" the profile of returns that their equity investment will better meet their objectives. For example, structured equity can provide an investor access to equity like returns, but with downside protection. To offset the cost of this protection, the investor sells the extreme equity returns that aren't needed, as illustrated in the graph below.



The optimum structure will depend on the prevailing market conditions, but the tools available are flexible and can be used to tailor equity investment to the investment objectives, views and risk appetite of the Committee and needs of the Fund.

A structured equity solution can be based on a specific equity index e.g. the FTSE100 or a combination of indices to allow a more global exposure. The structure is in place for a pre-determined time horizon e.g. 3 years, but can be redeemed earlier with minimal trading costs. However, the target return profile will only be achieved if the structure is held to maturity. An investment of this nature can be considered to be akin to a passive equity investment (as returns are dependent of the movement of market indices) and profits are usually hedged back into GBP to remove all currency risk.

The result of a structured equity solution is to provide participation in equity market returns, whilst protecting the investment from significant falls that characterise equity investment. We believe the inclusion of such an investment can reduce the volatility of the equity investment and the assets overall.

5.2.1 Proposed action

The Fund currently gains exposure to equity markets through the Majedie and MFS mandates. While we do not propose that these mandates are changed at this time, the introduction of the LGIM mandate will also allow the Fund to gain access to equity derivatives.

We propose to work with LGIM to consider how equity protection could be introduced to the Fund's investment strategy and to report back to the Committee at a future meeting.

We look forward to discussing our review and proposals with the Committee at their forthcoming meeting.

P-Solve Asset Solutions
August 2011

Appendix 1: A note on economic modelling

For the purposes of this exercise, we consider seven different scenarios, as described below:

Benign	Conditions that represent our views for a generally sluggish economic recovery with increased, but controlled, inflation. Risk assets deliver generally positive returns although sovereign bond yields increase over time.
Inflationary	Inflation increases rapidly before stabilising at a significantly higher level than currently expected. Real economic growth returns to trend levels and nominal sovereign bond yields increase significantly in the face of higher inflation.
Depression	Mild depression with several years of falling GDP before a recovery to above trend levels. Inflation falls in the short term before increasing with sovereign bond yields increasing over the longer term. Risky assets struggle in the short term.
Stagnation	Economy stabilises with growth remaining below historic trend levels over the log term. Inflation remains low but positive but sovereign bond yields remain largely unchanged.
Rapid Recovery	The hoped for V shaped recession with a rapid rebound to trend growth. Inflation remains stable but higher than forecast with risky assets generally delivering higher short term returns.
Stagflation	Inflation continues to run over a prolonged period of time with real growth low but positive. Nominal bond yields increase significantly over time from current levels.
Japan	Conditions where low economic growth persists leads to near zero interest rates and inflation over a long period of time. Nominal bond yields fall from current levels.

Our projected investment returns under each scenario are built up from underlying fundamentals, for example real growth and inflation expectations, but also from expectations for factors such as corporate profits and P/E ratios. We also take into account current views on market pricing.

It is worth noting that our set of economic scenarios will change with time. For example, in more positive times we would include scenarios such as growing asset bubbles and rapid slowdowns in economic activity, caused by external shocks.

We should also note that the economic scenarios are based on a number of assumptions which may not be borne out in practice. In addition, the range of scenarios considered represent a broad range of possible outcomes but should not be considered to be exhaustive. In particular the Depression scenario is not intended to represent a "worst case scenario".

The Trustees should also note that no model, however sophisticated, can be predictive or correct. On balance, we suggest that putting numbers on volatilities, co-variances, and expected returns is at best an inexact science. What is important is that each move/change to investments we make involves a clear expectation of improvement in risk/return terms. So, while putting absolute numbers on these measures is difficult, they are helpful in identifying the relative characteristics of different strategies.