HYMANS ROBERTSON

Surrey Pension Fund

Employer Results Report:
Valuation as at 31 March 2016

Barry McKay

Fellow of the Institute and Faculty of Actuaries

For and on behalf of Hymans Robertson LLP

Contents

Employer Results Report Page

Appendices

1 Introduction

The Fund Actuary is currently conducting the 31 March 2016 formal valuation of the Surrey Pension Fund of which you are a participating employer. The Fund is one part of the Local Government Pension Scheme (LGPS). This report is intended to accompany the Results Schedule which sets out your own draft formal valuation results.

This is a component report of the final aggregate valuation report.

The following Technical Actuarial Standards[1] are applicable in relation to this report and have been complied with where material:

- TAS R – Reporting;
- TAS D – Data;
- TAS M – Modelling; and
- Pensions TAS.

A glossary is contained as Appendix A: please refer to this is you are unfamiliar with any of the terms used in this covering report or the Results Schedule.

What is a formal valuation?

A formal valuation has two main purposes:

- To calculate your funding position within the Fund
- To determine the contributions you will pay to the Fund from 1 April 2017 to 31 March 2020.

This report is intended to help you, as an employer within the Fund, to understand what your funding position means, how it can change and how this will impact on the contributions you pay to the Fund.

[1] Technical Actuarial Standards (TASs) are issued by the Financial Reporting Council (FRC) and set standards for certain items of actuarial work, including the information and advice contained in this report.

2 Your funding position

What is my funding position?

The 'Employer valuation results' table in Section 3 of the Results Schedule sets out your draft funding position as at 31 March 2016. Your funding position as at 31 March 2013 has also been included for comparative purposes.

- Past service liabilities: this is the value that has been placed on the benefits **built up to date** for your employees and ex-employees.

  Asset share: this is the market value of the share of the Fund's assets that have been allocated to you. The Fund Actuary calculates this from the Fund's investment returns since the last valuation along with the cashflows paid to and from the Fund in relation to your current and former employees. This is similar to how a bank account works with the investment return being a proxy for the interest you receive from the bank.

- Surplus/deficit: this is the difference between the assets you have and the past service liabilities you are responsible for. If you have more assets than liabilities you have a surplus. If you have fewer assets than past service liabilities then you have a deficit. You are responsible for repaying any deficit to the Fund over an agreed period ("the deficit recovery period").

- Funding level: this is the ratio of your share of the Fund's assets to your past service liabilities.

What will affect my funding position?

Data

A summary of the membership data as supplied to the Fund Actuary is summarised in Section 1 of the Results Schedule. It is the responsibility of the employer to ensure the Fund holds correct data in respect of your current and ex-employees. Incorrect data may impact on your formal valuation results and subsequently the contributions you pay to the Fund.

Actuarial assumptions

The assumptions are agreed between the Fund Actuary and the Administering Authority and are set out in the Fund's Funding Strategy Statement ("FSS").

The main assumptions are set out in Section 2 of the Results Schedule.

Further detail on the assumptions is set out in Appendix B.

Experience since the last formal valuation

Your funding position will be affected by the experience of the Fund and your membership over the last 3 years (or date of joining if more recent). This is set out in Section 3 of the Results Schedule in the table titled 'Reconciliation of surplus/deficit'. This is explained in Appendix C.

What can I do in the future to improve my funding position?

There are some elements of membership experience that employers can control. These are:

- The contributions you pay to the Fund: any contributions you make to the Fund (in addition to the cost of the benefits that are being earned by your employees) will decrease any deficit you have. You will also receive investment returns on any contributions you make.

- Salary increases: the pensionable salary increases awarded to your employees affect the pension received by them in retirement. If you intend to award higher salary increases than have been allowed for in the 2016 valuation assumptions, you may wish to ask the Administering Authority to investigate the impact of this.

You will find it helpful to speak with the Administering Authority regularly if you are concerned about your funding position or future pension costs. It may be possible to provide an indication of your funding position between formal valuation dates to allow you to monitor how your pension's obligations are changing.

3 The contributions you pay to the Fund

How are my valuation contributions calculated?

Employer contributions are normally made up of two elements:

a) the estimated cost of future benefits being built up from year to year, referred to as the "*primary rate*"; plus

b) a market adjustment which allows for the difference between the value of assets and the value of past service benefits, projected over an appropriate time horizon taking account of a range of possible expectations in future market conditions. This is referred to as the "*secondary rate*" and these contributions aim to achieve a fully funded positon for the employer at the end of the appropriate time horizon.

The primary rate will depend on the profile of your membership. For example, the rate is higher for older members as there is less time to earn investment returns before the member's pension comes into payment.

The methodology for calculating the primary rate will also depend on whether you are open or closed to new entrants. A closed employer will have a higher rate as we must allow for the consequent gradual ageing of the workforce.

There is no guarantee that the amount you pay for the primary rate will be sufficient to meet the cost of the benefits that accrue. Similarly, there is no guarantee that the secondary rate will return you to being fully funded at the end of your time horizon. The likelihood of meeting the target and being fully fund has been assessed and is displayed in your Results Schedule.

The contributions you are being asked to pay are set out in Section 4 of the Results Schedule. These may be different from the valuation contributions described as above. The reasons for any differences are discussed below.

What contributions do I have to pay?

As discussed above, there is no guarantee that the valuation contributions (either the primary or secondary components) will be sufficient. This is because the cost of benefits to be paid to members now and in the future is uncertain and will not be known until the last payment is made to the last members or dependent. The Fund actuary makes assumptions about the future in order to assess an appropriate contribution rate but these assumptions are unlikely to be borne out in practice each and every year in the future.

The valuation contribution rate results and the contributions you are being asked to pay are set out in Section 4 of the Results Schedule.

The approach used to set contributions for you will depend on what type of organisation you are and nature of your participation in the Fund. Details of how employers are categorised and set funding targets are set out in the Fund's Funding Strategy Statement. One of the methods set out below will apply to you.

1. Stabilisation: this is a mechanism that allows contribution rate changes to be limited and may apply to some employers in the Fund. Please refer to the Funding Strategy Statement for further details on the employers that the Administering Authority have permitted to adopt a "stabilised" contribution strategy

2. Risk based contributions: for employers who are not permitted to stabilise, the rate payable will depend on:

    - the employer's funding target (usually the Fund's ongoing or cessation basis);
    - how long the employer has to reach the funding target; and
    - an appropriate likelihood of meeting the target (or 'likelihood of success') e.g. 2/3rds, 75%.

Further details are provided in Appendix D

HYMANS ROBERTSON LLP

Please refer to the Funding Strategy Statement for your Fund's policies for setting contributions.

The contributions you are asked for and as set out in the Fund's Rates and Adjustment Certificate are a minimum. Any additional contributions you pay to the Fund will have a positive impact on your funding position. The Rates and Adjustments Certificate must be published by 31 March 2017 and applies until 31 March 2020.

How long do I have to pay off the deficit?

This is set out in the Fund's Funding Strategy Statement and varies depending on your circumstances.

The "Valuation contribution rate results" shown in Section 4 of the Results Schedule will show the time horizon that applies to you.

What if I am part of a pool?

If you participate within a pool, all employers in the pool will be asked to pay the same contributions. These contributions may be more or less than you would have paid if you were an individual employer in the Fund.

What if I am planning to leave the Fund?

If you leave the Fund, a "cessation valuation" will be carried out. It will determine whether you have a surplus or deficit, where any deficit will have to be repaid to the Fund. The cessation payment is almost always significant and we strongly recommend that you contact the Fund if you believe your participation in the Fund may end in future for any reason. Where we have forward notice of a planned exit, we are able to target the repayment of the cessation deficit over time and minimise the risk of the Fund requiring a single large payment. Please refer to your Fund's Funding Strategy Statement for details on how a cessation valuation would be carried out.

If you are planning to leave the Fund soon, you may wish to ask the Fund for an indication of any cessation payment you will be asked to make.

Appendix A – Glossary

Actuarial assumptions/ basis	The combined set of assumptions made by the actuary, regarding the future, to calculate the value of **liabilities**. The main assumptions will relate to the **financial assumptions** such as **discount rate**, salary growth, pension increases and **demographic assumptions** such as longevity. More prudent assumptions will give a higher liability value, whereas more optimistic assumptions will give a lower value.
Administering Authority	The council with statutory responsibility for running the Fund, in effect the Fund's "trustees".
Deficit	The shortfall between the assets value and the **liabilities** value. This relates to assets and liabilities built up to date, and ignores the future build-up of pension (which in effect is assumed to be met by future contributions).
Demographic assumptions	These assumptions determine when a benefit is paid. The main demographic assumption is the mortality assumption, which determines how long benefits are paid for. Other examples of demographic assumptions are the number of employees that leave the Fund and the number of employees that retire with ill-health benefits
Discount rate	The annual rate at which future assumed cashflows (in and out of the Fund) are discounted to the present day. This is necessary to provide a **liabilities** value which is consistent with the present day value of the assets, to calculate the **deficit**. A lower discount rate gives a higher liabilities value, and vice versa. It is similarly used in the calculation of the **primary rate** and the **common contribution rate**.
Employer	An individual participating body in the Fund, which employs (or used to employ) **members** of the Fund. Normally the assets and **liabilities** values for each employer are individually tracked, together with its **primary rate** at each **valuation**.
Financial assumptions	The main financial assumptions are the discount rate (assumed investment return), the salary increase assumption and the pension increase assumption.
Funding level/position	The ratio of assets value to **liabilities** value. The ideal position is 100%. If it is less than 100% then you have a deficit; if it is more than 100% then you have a surplus.
Liabilities	The actuarially calculated present value of all pension entitlements of all **members** of the Fund, built up to date. This is compared with the present market value of Fund assets to derive the **deficit**. It is calculated on a chosen set of **actuarial assumptions**.
LGPS	The Local Government Pension Scheme, a public sector pension arrangement put in place via Government Regulations, for workers in local government. These Regulations also dictate eligibility (particularly for Scheduled Bodies), members' contribution rates, benefit calculations and certain governance requirements. The LGPS is divided into 101 Funds which map the UK. Each LGPS Fund is autonomous to the extent not dictated by Regulations, e.g. regarding investment strategy, employer contributions and choice of advisers.

Members The individuals who have built up (and may still be building up) entitlement in the Fund. They are divided into actives (current employee members), deferreds (ex-employees who have not yet retired) and pensioners (ex-employees who have now retired, and dependants of deceased ex-employees).

Pooling Employers may be grouped together for the purpose of calculating contribution rates, so that their combined membership and asset shares are used to calculate a single contribution rate applicable to all employers in the pool. A pool may still require each individual employer to ultimately pay for its own share of **deficit**, or (if formally agreed) it may allow **deficits** to be passed from one employer to another.

Primary rate The actuarially calculated cost of each year's build-up of pension by the current active **members**, excluding members' contributions but including Fund administrative expenses. This is calculated using **actuarial assumptions**.

Profile The profile of an employer's membership or liability reflects various measurements of that employer's **members**, i.e. current and former employees. This includes: the proportions which are active, deferred or pensioner; the average ages of each category; the varying salary or pension levels; the lengths of service of active members vs. their salary levels, etc. A membership (or liability) profile might be measured for its **maturity** also.

Secondary rate The part of the employer's annual contribution which relates to achieving a fully funded position in relation to past service over an appropriate time horizon.

Stabilisation Any method used to smooth out changes in employer contributions from one year to the next. This is very broadly required by the LGPS Regulations, but in practice is particularly employed for large stable employers in the Fund. Different methods may involve: risk-based modelling of future market movements; longer deficit recovery periods; higher discount rates; phasing of changes in rates or some combination of these.

2016 valuation rate The employer's contribution rate, including both **primary rate** and **secondary rate**.

Valuation An actuarial investigation to calculate the **liabilities**, **primary rate** and common contribution rate for a Fund, and usually individual employers too. This is normally carried out in full every three years (last done as at 31 March 2016), but can be approximately updated at other times. The assets value is based on market values at the valuation date, and the liabilities value and contribution rates are based on long term bond market yields at that date also.

Appendix B – Demographic assumptions

Males

Age	Salary Scale	Incidence per 1000 active members per annum						
		Death Before Retirement	Withdrawals		Ill Health Tier 1		Ill Health Tier 2	
		FT & PT	FT	PT	FT	PT	FT	PT
20	105	0.21	219.73	439.47	0.00	0.00	0.00	0.00
25	117	0.21	145.14	290.28	0.00	0.00	0.00	0.00
30	131	0.26	102.98	205.93	0.00	0.00	0.00	0.00
35	144	0.30	80.46	160.88	0.12	0.09	0.10	0.07
40	150	0.51	64.78	129.48	0.20	0.15	0.16	0.12
45	157	0.85	60.85	121.60	0.44	0.33	0.35	0.27
50	162	1.36	50.16	100.12	1.13	0.85	1.14	0.85
55	162	2.13	39.50	78.88	4.42	3.32	2.56	1.92
60	162	3.83	35.20	70.28	7.78	5.84	2.20	1.65
65	162	6.38	0.00	0.00	14.78	11.09	0.00	0.00

Please note that the withdrawal figures include tier 3 ill health.

Females

Age	Salary Scale	Incidence per 1000 active members per annum						
		Death Before Retirement	Withdrawals		Ill Health Tier 1		Ill Health Tier 2	
		FT & PT	FT	PT	FT	PT	FT	PT
20	105	0.12	151.58	252.63	0.00	0.00	0.00	0.00
25	117	0.12	101.99	169.97	0.12	0.09	0.10	0.07
30	131	0.18	85.50	142.46	0.16	0.12	0.13	0.10
35	144	0.30	73.79	122.91	0.32	0.24	0.26	0.19
40	150	0.48	61.42	102.26	0.48	0.36	0.39	0.29
45	157	0.77	57.31	95.41	0.65	0.48	0.51	0.39
50	162	1.13	48.32	80.35	1.21	0.91	1.22	0.92
55	162	1.49	36.05	60.02	4.48	3.36	2.60	1.95
60	162	1.90	29.06	48.31	9.51	7.14	2.69	2.01
65	162	2.44	0.00	0.00	17.09	12.82	0.00	0.00

Please note that the withdrawal figures include tier 3 ill health.

Longevity

	Male	Female
Current pensioners	21.5 years	24.1 years
Future pensioners	23.7 years	26.2 years

Future pensioners are assumed to be aged 45 as at 31 March 2016

Commutation assumptions and take – up of the 50:50 scheme

These assumptions are set out in the Results Schedule.

Retirement age pattern

We have adopted the retirement age pattern assumption as specified by the Scheme Advisory Board for preparing Key Performance Indicators. Further details about this assumption are available on request.

Appendix C – Reconciliation of Surplus/Deficit

Interest on the surplus/deficit	A surplus or deficit in the Fund will grow in line with the Fund Actuary's expectation of future investment performance (the discount rate).
Investment returns greater/less than expected	The Fund Actuary makes an assumption about the Fund's investment return each year (the discount rate). Where the Fund's actual returns have been greater than this, this will have a positive effect on the funding position. If the Fund's actual return each year is less than the discount rate, this will have a negative effect.
Contributions greater/less than the cost of accrual	Any contributions you pay to the Fund in excess of the assessed cost of the benefits that have been earned by your employees will have a positive effect on the funding position.
Salary increases more/less than expected	The Fund Actuary makes an assumption about the level of future salary increases. If you have awarded salary increases that are higher over the last three years, this will have a negative effect on your funding position. If you have awarded lower salary increases, this will have a positive effect on your funding position. **You should be aware of the level of salary increases that the Fund Actuary has assumed in their calculations and consider the pension costs if you intend to award higher salary increases to your employees.**
Pension increases more/less than expected	The Fund Actuary makes an assumption for the expected levels of the Consumer Price Index. This is the expected level of future pension increases for deferred and pensioner members. Over the period from 2013 to 2016, actual pension increases have been slightly lower than assumed. This has a small positive impact on the funding position.
Ill-health retirement strain/contributions paid	The Fund Actuary makes an allowance for people to retire early with ill-health benefits. Ill-health early retirements cost more than normal retirements. If fewer members than expected have retired on ill-health grounds, this will have a positive impact on your funding position. If more members than expected have retired on ill-health then this will have a negative impact on your valuation results.
Redundancy/ efficiency early retirement strain/ contributions paid/ payable	The Fund Actuary is supplied with data for all other early retirements. The cost of each early retirement is calculated and will have a negative impact on the funding position. However, any early retirement contributions you have made to the Fund will have a positive effect on your funding position. Due to differences in the way these calculations are carried out, the payment you have made to the Fund may be more or less than the actuarially assessed strain cost.
Early leavers more/fewer than expected	At the 2013 valuation, an assumption was made about the number of members who would withdraw from the Fund. Early leavers' benefits usually cost less than normal retirements. The Fund Actuary compares the actual number of leavers to the expected number of

	leavers for the last three years. Where this is more than expected, this will have a positive impact on the funding position. Where this is less than expected, this will have a negative impact on the funding position.
Pensioner deaths more/less than expected	At the 2013 valuation, an assumption was made about how long members would live for. Where pensioners have lived for longer than expected, this will have a negative impact on your funding position. Where more pensioners have died than expected, this would have a positive impact on your funding position.
Commutation higher/lower than expected	An assumption was made at the 2013 valuation for the amount of pension that a retiring member would choose to commute to receive an additional lump sum. Usually a lump sum costs less than the valuation assessment of the pension commuted. Where members commute a higher amount of pension than expected, this will have a positive impact on the funding position, and vice versa.
Change in demographic assumptions	At each valuation the Fund Actuary performs an experience analysis to compare all demographic assumptions with those assumed at the previous valuation. The demographic assumptions are then altered for the following valuation to more closely reflect what has happened. The impact of the change in these assumptions will depend on the profile of your own membership data.
Change in mortality assumptions	Similarly to the demographic assumptions, the mortality (i.e. life expectancy) assumption is altered at each valuation to reflect more up to date experience. The impact of the change in these assumptions will depend on the profile of your own membership data, and the assumption adopted at the last formal valuation.
Change in financial assumptions	Financial assumptions are derived with reference to current market conditions at each valuation date. The net discount rate (the difference between the discount rate and the salary or pension increase assumption) has an impact on the value placed on the benefits earned to date (“the liabilities”). A smaller net discount rate leads to a higher liability value.
Impact of bulk transfers	If you have been involved in any bulk transfers, there may be a profit or a loss if the value of assets you received (or paid) is different from the value of liabilities you assumed (or transferred). This applies to both transfers between Funds and transfers to/from employers within the Fund. Any transfers that occur on a “fully funded” basis have no impact on the funding position of an employer.
LGPS 2014 50/50 take up experience	At the 2013 valuation the Fund Actuary made an assumption on the number of members they expected to take up the 50/50 option in the LGPS 2014 scheme. Where more members than expected have joined the 50/50 scheme, this will have a positive impact on the funding position, and vice versa.
Other experience items	Based on the data available to the Fund Actuary, it is not possible to analyse the impact of all experience. Any unanalysed experience is allocated here.

Appendix D – Technical appendix for contribution rate modelling

In order to assess the likelihood of the employer's section of the Fund achieving full funding we have carried out stochastic asset liability modelling (ALM) that takes into account the main characteristics and features of the employer's share of the Fund's assets and liabilities. For some employers a full ALM, known as comPASS has been used. For other employers a simplified ALM, known as TARGET has been used.

The Results Schedule sets out the total valuation contribution rate that is sufficient to pay for the benefit that is accrued over the time horizon and return the employer's section of the Fund to a fully funded position for a given probability of success. The probability has been agreed with the Administering Authority and is dependent on each employer's own circumstances.

As with all modelling, the results are dependent on the model itself, the calibration of the model and the various approximations and estimations used. These processes involve an element of subjectivity. No inferences should be drawn from the modelling results other than those confirmed by us in writing.

The following sections provide more detail on the background to the modelling.

Cash flows

In projecting forward the evolution of each employer's section of the Fund, we have used anticipated future cash flows. These cash flows have been generated using the membership data provided for the formal valuation as at 31 March 2016, the demographic and financial assumptions used for the valuation and make an allowance for future new joiners to the Fund.

For comPASS we have estimated future service benefit cash flows and projected salary roll for new entrants after the valuation date such that payroll remains constant in real terms (i.e. full replacement) unless otherwise stated. There is a distribution of new entrants introduced at ages between 25 and 65, and the average age of the new entrants is assumed to be 40 years. All new entrants are assumed to join and then leave service at SPA, which is a much simplified set of assumptions compared with the modelling of existing members. The base mortality table used for the new entrants is an average of mortality across the LGPS and is not client specific, which is another simplification compared to the modelling of existing members. TARGET uses a similar, but simplified, approach to generating new entrants. Nonetheless, we believe that these assumptions are reasonable for the purposes of the modelling given the highly significant uncertainty associated with the level of new entrants.

We do not allow for any variation in actual experience away from the demographic assumptions underlying the cash flows. Variations in demographic assumptions (and experience relative to those assumptions) can result in significant changes to the funding level and contribution rates. We allow for variations in inflation (RPI or CPI as appropriate), inflation expectations (RPI or CPI as appropriate), interest rates, yield curves and asset class returns. Cash flows into and out of the Scheme are projected forward in annual increments and are assumed to occur in the middle of each Scheme year. Investment strategies are assumed to be rebalanced annually.

Asset liability model (comPASS)

These cash flows, and the employer's assets, are projected forward using stochastic projections of asset returns and economic factors such as inflation and bond yields. These projections are provided by the Economic Scenario Service (ESS), our (proprietary) stochastic asset model, which is discussed in more detail below.

In the modelling we have assumed that the Fund will undergo valuations every three years and a contribution rate will be set that will come into force one year after the simulated valuation date. For 'stabilised' contributions, the rate at which the contribution changes is capped and floored. There is no guarantee that such capping or flooring will be appropriate in future; this assumption has been made so as to illustrate the likely impact of practical steps that may be taken to limit changes in contribution rates over time. We have assumed that the Actuary to the Fund will make his or her calculations using broadly the

same methodology as that currently used, but note that this is a source of uncertainty that we have not attempted to measure in the model other than where noted specifically.

Unless stated otherwise, we have assumed that all contributions are made and not varied throughout the period of projection irrespective of the funding position. In practice the contributions are likely to vary especially if the funding level changes significantly.

Investment strategy is also likely to change with significant changes in funding level, but unless stated otherwise we have not considered the impact of this in order to focus on the high level investment strategy decision.

In allowing for the simulated economic scenarios, we have used suitable approximations for updating the projected cash flows. The nature of the approximations is such that the major financial and investment risks can be broadly quantified. However, a more detailed analysis would be required to understand fully the implications and appropriate implementation of a very low risk or 'cash flow matched' strategy.

We would emphasise that the returns that could be achieved by investing in any of the asset classes will depend on the exact timing of any investment/disinvestment. In addition, there will be costs associated with buying or selling these assets. The model implicitly assumes that all returns are net of costs and that investment/disinvestment and rebalancing are achieved without market impact and without any attempt to 'time' entry or exit.

Asset liability model (TARGET)

TARGET uses a similar, but simplified, modelling approach to that used for comPASS.

Contribution rates are inputs to the model and are assumed not to vary throughout the period of projection, with no valuation every three years or setting of 'stabilised' contribution rates.

In allowing for the simulated economic scenarios, we have used more approximate methods for updating the projected cash flows. The nature of the approximations is such that the major financial and investment risks can be broadly quantified.

When projecting forward the assets, we have modelled a proxy for the Fund's investment strategy by simplifying their current benchmark into growth (UK equity) and non-growth (index-linked gilts) allocations, and then adjusting the volatility of the resultant portfolio results to approximately reflect the diversification benefit of the Fund's investment strategy.

Economic Scenario Service

The distributions of outcomes depend significantly on the Economic Scenario Service (ESS), our (proprietary) stochastic asset model. This type of model is known as an economic scenario generator and uses probability distributions to project a range of possible outcomes for the future behaviour of asset returns and economic variables. Some of the parameters of the model are dependent on the current state of financial markets and are updated each month (for example, the current level of equity market volatility) while other more subjective parameters do not change with different calibrations of the model.

Key subjective assumptions are the average excess equity return over the risk free asset (tending to approximately 3% p.a. as the investment horizon is increased), the volatility of equity returns (approximately 18% p.a. over the long term) and the level and volatility of yields, credit spreads, inflation and expected (breakeven) inflation, which affect the projected value placed on the liabilities and bond returns. The market for CPI linked instruments is not well developed and our model for expected CPI in particular may be subject to additional model uncertainty as a consequence. The output of the model is also affected by other more subtle effects, such as the correlations between economic and financial variables.

Our expectation (i.e. the average outcome) is that long term real interest rates will gradually rise from their current low levels. Higher long-term yields in the future will mean a lower value placed on liabilities and therefore our median projection will show, all other things being equal, an improvement in the current funding position (because of the mismatch between assets and liabilities). The mean reversion in yields also affects expected bond returns.

HYMANS ROBERTSON LLP

While the model allows for the possibility of scenarios that would be extreme by historical standards, including very significant downturns in equity markets, large systemic and structural dislocations are not captured by the model. Such events are unknowable in effect, magnitude and nature, meaning that the most extreme possibilities are not necessarily captured within the distributions of results.

Given the context of this modelling, we have not undertaken any sensitivity analysis to assess how different the results might be with alternative calibrations of the economic scenario generator.

We would be happy to provide fuller information about the scenario generator, and the sensitivities of the results to some of the parameters, on request.

Expected Rate of Returns and Volatilities

The following figures have been calculated using 5,000 simulations of the Economic Scenario Service, calibrated using market data as at 31 March 2016. All returns are shown net of fees. Percentiles refer to percentiles of the 5,000 simulations and are the annualised total returns over 5, 10 and 20 years, except for the yields which refer to the (simulated) yields in force at that time horizon. Only a subset of the asset classes are shown below. Similar information for additional classes is available on request.

		Annualised total returns								Inflation	17 year real yield	17 year yield
		Cash	Index Linked Gilts (medium dated)	Fixed Interest Gilts (medium dated)	Corporate Bonds (medium dated)	UK Equity	Overseas Equity	Property	Diversified Growth Fund			
5 years	16th %'ile	-0.3%	-2.2%	-2.5%	-2.7%	-3.7%	-5.6%	-3.8%	-1.9%	1.2%	-1.6%	1.7%
	50th %'ile	0.8%	0.6%	0.5%	1.2%	4.5%	4.1%	2.0%	3.5%	2.6%	-0.7%	3.0%
	84th %'ile	2.0%	3.5%	3.4%	5.2%	12.7%	14.3%	8.3%	9.2%	4.2%	0.2%	4.5%
10 years	16th %'ile	0.2%	-1.0%	-0.4%	-0.5%	-1.1%	-2.6%	-1.8%	-0.1%	1.4%	-1.5%	1.9%
	50th %'ile	1.7%	0.8%	1.0%	1.8%	5.0%	4.6%	2.8%	3.8%	2.8%	-0.3%	3.5%
	84th %'ile	3.3%	2.7%	2.4%	4.1%	11.1%	12.1%	7.5%	8.1%	4.5%	0.9%	5.5%
20 years	16th %'ile	1.1%	-0.2%	1.1%	1.1%	1.3%	0.2%	0.1%	1.8%	1.7%	-0.7%	2.3%
	50th %'ile	2.8%	1.2%	2.0%	2.7%	5.9%	5.6%	3.7%	4.7%	3.0%	0.8%	4.0%
	84th %'ile	4.8%	2.9%	2.9%	4.4%	10.7%	11.2%	7.6%	7.8%	4.4%	2.3%	6.3%
	Dispersion (1 yr)	1%	7%	9%	11%	16%	19%	14%	12%	1%		

The current calibration of the model indicates that a period of outward yield movement is expected. For example, over the next 20 years our model expects the 17 year maturity annualised real (nominal) interest rate to rise from -1.0% (2.2%) to 0.8% (4.0%).