

Setting assumptions for the 2019 valuation

Executive Summary

The Lincolnshire Pension Fund ("the Fund") will undertake a triennial valuation as at 31 March 2019. The valuation is a statutory requirement of the Local Government Pension Scheme Regulations ("the LGPS") which facilitates a health check of the Fund against an appropriate funding target and a review of its funding plan. Actuarial assumptions are required to calculate the liabilities that feed into the funding target and plan.

The assumptions are informed estimates about future experience. Over time they may need to be updated to reflect emerging evidence and changes in the regulatory and environmental background. We have carried out a review of the financial assumptions that were used at the 2016 valuation to check if they remain fit for purpose at the 2019 valuation. Our current recommendation for the demographic assumptions are also set out at the end of this paper. Our recommendation for longevity is based on recent experience Fund data from our Club Vita team and so is based on updated membership data.

The results of our review are summarised below. Where we have proposed a change in assumption from 2016 we have also noted the reason. Fuller details about the assumptions are contained within this paper.

Assumption	2016 assumption	Proposed 2019 assumption	Reason for change
Investment return margin - Long term margin above risk free rate from year 20	1.8% p.a.	2% p.a.	Increase due to output from modelling of portfolio returns.
Pension Increases - RPI-CPI gap	RPI – 1.0% p.a. (=CPI)	RPI – 1.0% p.a. (=CPI)	No change
Salary increases - Inflationary	RPI – 0.6% p.a.	RPI – 0.7% p.a.	No change in methodology. Expectation that short-term salary increases will remain low.
Longevity - Baseline - Future Improvements	Club Vita analysis CMI model, 2013 version, long term rate of improvements of 1.25% p.a.	Club Vita analysis CMI model (latest version), long term rate of improvements of 1.25% p.a.	No change in methodology. Later version of CMI table reflects more recent experience.

Contents

	Page
Addressee, Purpose and Background	3
Financial Assumptions	
Investment Return / Discount Rate	4
Inflation/pension increases	7
Salary increases	8
Demographic Assumptions	
Longevity	10
Retirement demographics	12
Reliances and Limitations	13

Addressee

This paper has been commissioned by Lincolnshire County Council in its capacity as Administering Authority to the Lincolnshire Pension Fund (“the Fund”). It has been prepared by Hymans Robertson LLP in our capacity as actuaries to the Fund.

Purpose

The purpose of this paper is to propose assumptions to set the funding target for the Fund’s upcoming formal valuation as at 31 March 2019.

Background

Pension schemes exist to pay benefits earned by their members during their years of eligible service. In the LGPS, the scheme is split into separate funds which pay benefits earned by past and present employees of participating employers; the Lincolnshire Pension Fund is one such fund. The actual cost of paying all the benefits cannot be known with certainty until the final benefit payment is made to the last remaining member. In funded schemes, like the LGPS, the benefits must be paid for out of funds set aside in advance. In order to determine how much money to set aside, it is necessary to make assumptions about the level of the benefits and the returns that will be achieved on the Fund’s assets (financial assumptions) and when benefits will be paid to members (demographic assumptions). These assumptions are agreed by the Fund based on advice from its actuary and are used to set the funding target.

The Fund will undertake a triennial valuation as at 31 March 2019. The valuation is a statutory requirement of the Regulations which facilitates a health check of the Fund against an appropriate funding target and a review of its funding plan. In order to carry out the valuation, actuarial assumptions are required to set an appropriate funding target.

The assumptions are informed estimates about future experience. Over time they may need to be updated to reflect emerging evidence and changes in the regulatory and environmental background. Ahead of the 2019 valuation, we have carried out a review of the financial assumptions used to set the funding target at the 2016 valuation. The results of our review are summarised below. Where we have proposed a change in assumption from 2016 we have also noted the reason.

The following sections examine the main financial and demographic assumptions in detail.

Financial assumptions

Broadly speaking, financial assumptions relate to the level of benefits (i.e. the amount in £) when they are in payment and their equivalent value in today's terms.

Investment returns (“the discount rate”)

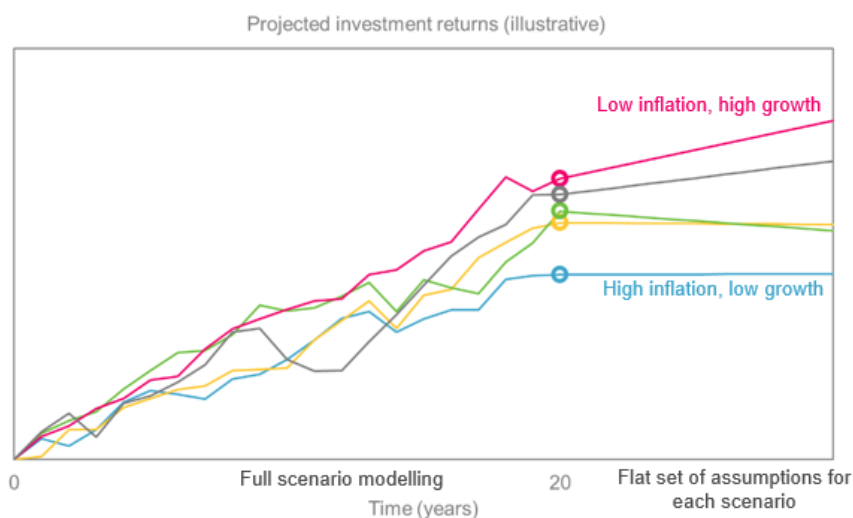
At the 2016 valuation, the Fund adopted a risk-based approach to setting contribution rates. This approach projects the Fund's future investment returns for the next 20 years under a range of different economic scenarios generated by Hymans Robertson's proprietary Economic Scenario Service (ESS). This model projects 5,000 different economic scenarios, on a year by year basis, and then analyses the expected performance of each of the asset classes the Fund holds under each scenario to generate the best possible understanding of the range of possible asset returns over the 20 year period. The range of investment returns over the next 20 years is therefore captured in the risk-based modelling rather than via a single discount rate assumption.

Beyond a 20 year time horizon, the future becomes even more uncertain and we move to valuing future benefit payments by making a fixed assumption about future investment returns, or a long-term target discount rate. This assumption is part of the funding target, and therefore the level of prudence in this assumption dictates the amount of assets the Fund wants to hold to pay for future benefits.

Each of the projected 5,000 scenarios represents different prevailing economic conditions in 20 years. Choosing a single value across all 5,000 scenarios would not be appropriate: e.g. a high discount rate would not be prudent in scenarios with a weak outlook for economic growth. Instead, we need some way of setting the prudent return so it is appropriate in each of the 5,000 scenarios in force in 20 years' time. We do this by expressing the discount rate relative to a variable which serves as a suitable proxy for the economic outlook in each scenario.

Our preferred choice for this variable is the long-term 'risk-free' interest rate, estimated using the yield on long-term UK government bonds at year 20 (as generated by our model for each scenario). This choice is justified on the basis that the Fund's investment strategy will include a proportion of risky assets whose long-term returns can be expected to exceed the 'risk-free' rate. Indeed, the Fund will usually have expectations of what the margin is above 'risk-free' when investing in these different asset classes.

The chart below illustrates how the investment returns generated by the model might vary over time, including the transition to a flat assumption after year 20. Although the assumption stops varying *within* each scenario after this point, it still varies *across* the different scenarios depending on the economic outlook in each one.



Results of our analysis

The following table shows the likelihood of the Fund's assets achieving a specific return (or margin) above the 'risk free' rate, both assessed from year 20. This assumes that the current investment strategy will remain in place.

Likelihood of achieving this margin from year 20	Margin above the risk-free rate (% p.a.)		
	1.8%	2.0%	2.2%
Current strategy	71%	68%	65%

It can be seen that your current investment strategy supports a margin of 2.0% above the risk-free rate 68% of the time – this is above our “2 in 3” (or 66%) threshold for the likelihood of success. We are, therefore, happy for the margin to be increased from 1.8% or 2.0%.

Comparison with 2016 valuation

The long-term margin used in the 2016 valuation was 1.8% p.a. over the risk-free rate. The proposed margin for 2019 has been increased to 2.0% p.a.

What are the implications of choosing a higher margin?

If the Fund was to choose a higher margin, it would be opting to target a less prudent funding position for employers. This would mean that:

- The Fund would gradually hold less money than it otherwise would have (all other things being equal).
- Long term asset liability modelling would show an increased likelihood of full funding assuming a fixed contribution rate (as the funding target would be lower so it will cost less to get there).
- There is less chance of investment performance achieving this return each and every year in the future. If there is any investment underperformance (relative to expectations), all other things being equal, higher than expected contributions would be required to compensate for the lost return.

In summary, reducing prudence tends to lead to immediate downwards pressure on employer contributions, but increases the likelihood of future contribution increases due to a larger risk of investment underperformance (since the 'investment bar' has been raised).

Assessing and declaring LGPS funding positions

For comparison purposes, all LGPS funds will be required by the national Scheme Advisory Board to report their 2019 valuation funding position on a like-for-like basis i.e. using the same actuarial assumptions. This effectively strips out prudence from local funding valuations to allow more meaningful comparisons about the strength (or otherwise) of funding strategies across all LGPS funds. The proposed change to the Lincolnshire margin will, therefore, have no impact on this like-for-like assessment.

At the 2016 valuation, for the purpose of showing a funding level at the valuation date, our approach was to report an assumed investment return that was based on a given margin above the risk-free interest rate at 31 March 2016 (specifically, the yield on long term UK government bonds). At the 2019 valuation, our methodology in calculating the assumed future investment return to be used when assessing a current (single) funding position will be consistent with the risk-based approach adopted in setting contribution rates. In practice, we will use a single value derived from the 5,000 investment return assumptions in the first 20 years that are behind the risk-based approach used for setting contributions. Our choice of investment return (discount rate) will be based on the likelihood of that return being achieved. Whatever value is chosen will determine both how likely that return is to be achieved and also the funding level declared. A higher chosen rate will lead to a higher declaration, but less chance of it being achieved (and vice versa).

Importantly, the use of this risk-based approach to assess the current funding position will have no impact on one of the key valuation outputs – the contribution rates; these will continue to be set with regard to the existing risk-based approach described earlier.

Recommended assumption

We are happy for the long-term margin to be increased to 2% p.a. over the risk-free rate.

Inflation / pension increases

LGPS benefits increase each year in line with the Consumer Prices Index (“CPI”) measure of inflation, which is therefore a key financial assumption for the valuation. The most objective way to measure future financial values is to use information from the financial markets. In theory, the CPI assumption would be set based on the prices of CPI-linked government bonds, which would give the market’s expectation of future CPI increases. If the return on a conventional government bond was 3% p.a. and the return on an (otherwise identical) CPI-linked government bond was 1% p.a., this would imply that the market expects long-term CPI inflation to be 2% p.a. However, in the UK the only inflation-linked government bonds are based on the Retail Prices Index (“RPI”), an alternative measure of price increases. We therefore calculate the market-implied value of future RPI increases and adjust it to get an assumption for CPI.

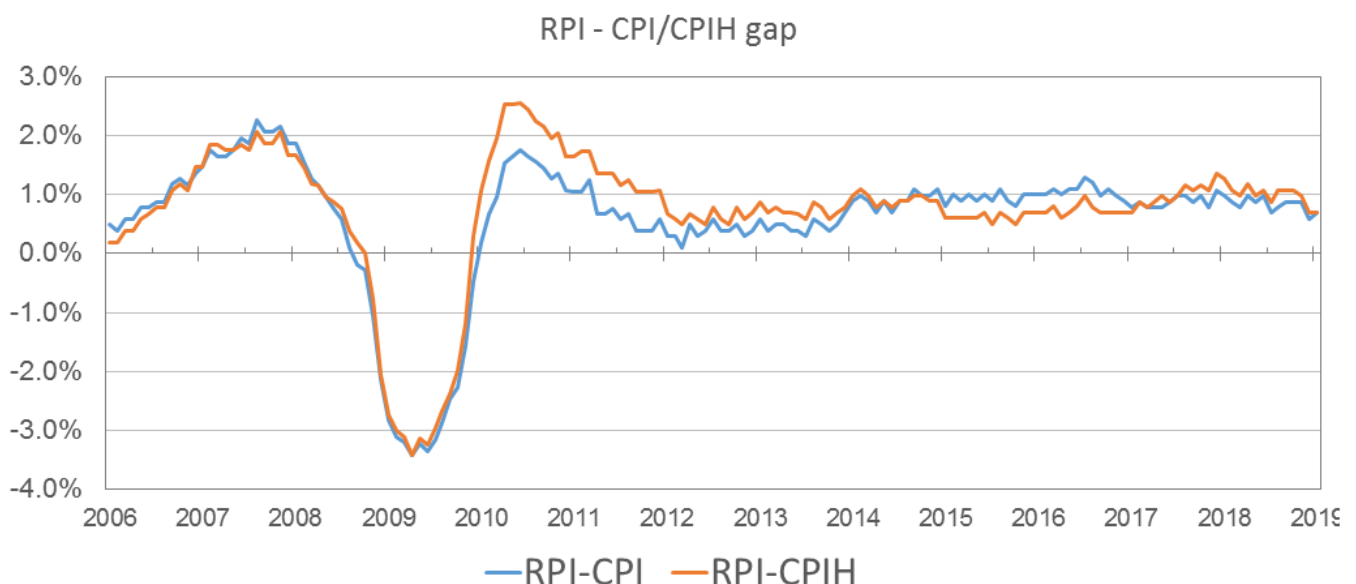
The two main differences between RPI and CPI are

- The ‘basket’ of goods that each measure is based on (e.g. CPI doesn’t include mortgage payments); and
- The ‘formula effect’ which is related to the way the index is calculated from the price changes of the goods in the basket.

At the 2016 valuation, CPI was assumed to be 1.0% less than RPI.

When considering the assumption for the 2019 valuation, we have taken into account:

- Proposed changes to the indexation measure of public sector pensions: in the 2018 Budget, the Chancellor announced that all public sector pensions, including the LGPS, will move the inflation indexation measure “over time” from CPI to a measure known as CPIH (similar to CPI but it includes owner occupier’s housing costs) “when and where practicable”. There is no set timeframe on this move, therefore we propose to make no explicit allowance for this change at the 2019 valuation.
- Observed differences between RPI and CPI/CPIH : the chart below tracks these since 2006.



The gap between RPI and CPI has remained relatively steady since the start of the decade at around 1.0%.

Recommended assumption

Based on the above analysis and reasoning, we recommend the CPI assumption at the 2019 valuation remains at 1.0% p.a. less than assumed RPI.

Salary increases

The salary increase assumption comes in two parts:

- Annual 'inflationary' salary awards, historically set in order for employees' pay to at least keep up with the cost of living
- Promotional salary awards or those awarded as part of a defined salary scale.

This part of the paper considers the first element of the salary growth assumption only. Assumptions about promotional salary awards are considered later under Demographic Assumptions.

At the 2016 valuation, the assumption for 'inflationary' increases needed to take into account:

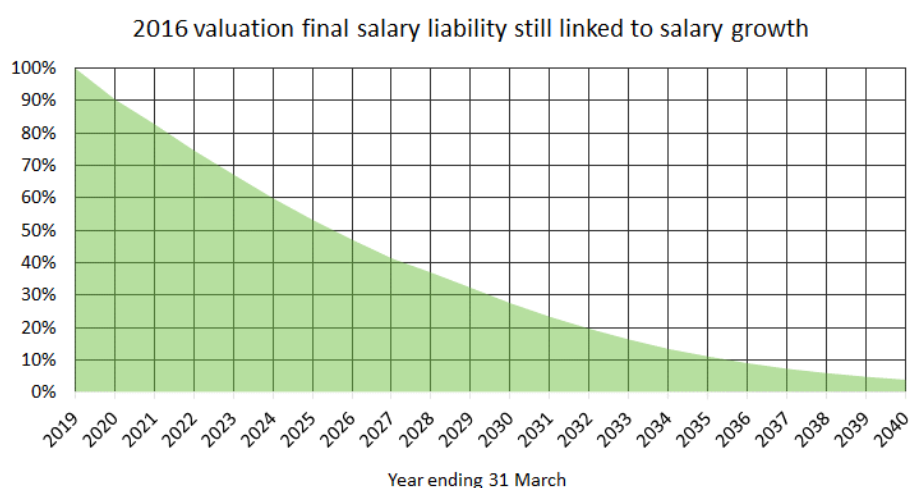
- 1 A large proportion of the Fund's overall past service liabilities were still linked to final salary i.e. those benefits accrued before 31 March 2014; and
- 2 The Government's 2015 Summer Budget announced that funding would only be provided to meet public sector salary increases of 1% p.a. up to March 2020.

Therefore the 2016 valuation salary increase was based on an underlying assumption of short term restraint (1% p.a.) to 31 March 2020, followed by long-term increases in line with Retail Prices Index (RPI) inflation. The single equivalent rate based on these assumptions, allowing for the expected run-off of final salary liabilities, was RPI less 0.6% p.a.

When considering the assumption to use at the 2019 valuation, we have revisited the two considerations outlined above.

Run-off of final salary liabilities

The chart below shows the expected run-off of the Fund's pre-2014 active member liabilities from the Fund's analysis at the last valuation i.e. the proportion of final salary liabilities remaining at each future year. The chart starts at 100% and falls eventually to zero as current active members with final salary benefits leave active status (due to retirement, withdrawal or death).



The declining proportion of active liabilities with a link to salary increases means that the importance of the salary growth assumption decreases over time, at least as far as the liability value is concerned. By 2019, around half of the pre-2014 active liability will no longer be active. Furthermore, from 2019 onwards the run-off plateaus and becomes more gradual, which will place more weight on longer term pay expectations compared to the 2016 valuation.

Future pay progression

Short term increases

Public sector pay increases were suppressed for many years following the 2008-09 economic crisis and the introduction of austerity policies, and this restraint had been expected to continue until at least 2020. Until 2017, central government operated a 1% cap on pay increases which was broadly mirrored in local government. However, with higher inflation and low unemployment the pressure to increase wages has risen markedly in recent years, particularly as public sector pay lagged behind the private sector. The government announced in July 2018 that it was awarding the highest pay increases in ten years to a range of public sector workers including teachers, NHS workers and the armed forces, perhaps signalling a return to 'normal' pay increases with a closer link to price inflation.

However, pay increases in local government are determined by local councils rather than central government, and the effects of austerity are still being felt in strained local authority budgets. It may therefore be reasonable to expect some continued restraint in the short term albeit higher than the 1% previously assumed. An assumption of 2% p.a. until 31 March 2024 was proposed following discussion with officers.

Long term increases

Similar arguments apply now as at the previous valuation in 2016. In the long term, increases are likely to fall between two extremes:

- Pay is increased substantially from current levels in order for public sector pay to 'catch-up' with historic averages (and the private sector).
- Continued low real pay rises reflecting, for example, higher inflation, economic uncertainty, outsourcing to private sector contractors, etc.

In practice, long term public sector salary growth beyond 2020 will depend on a variety of factors and it is extremely difficult to predict with any certainty what it is likely to be.

The RPI measure of inflation is arguably the better measure experienced by the 'in-work' population, due to the inclusion of housing costs (which are not included in the official CPI measure of inflation). In addition, some of the key elements of an individual's expenditure are set relative to RPI, for example regulated rail fares are currently increased each year in line with RPI plus 1% p.a. However, the expectation is there will be continued pressure on local council budgets in the longer term and it is expected that future salary increases will be lower than RPI – closer to RPI less 0.5%.

When we combine the short term pay restraint of 2% p.a. until 31 March 2024, and the longer term pay growth view, we can calculate a weighted average single pay increase assumption. Based on the Fund's membership profile, and assuming long term pay growth in line with RPI less 0.5%, the weighted average single pay increase assumption is equal to RPI less 0.7%.

Recommended assumption

Based on the above analysis and reasoning, we recommend a pay growth assumption of RPI less 0.7% for the 2019 valuation.

Demographic assumptions

Broadly speaking, demographic assumptions relate to the timing of benefits, i.e. when they start and for how long they are paid.

Longevity

Of all the demographic factors, longevity is the one that presents the greatest uncertainty to an LGPS fund. There are two components when setting an assumption for longevity:

- 1 How long people live for based on current observed life expectancies ('baseline longevity'); and
- 2 An allowance for possible future improvements to longevity ('future improvements').

The LGPS Longevity Index¹ shows that life expectancy in the LGPS has been steadily increasing over the last 20 years. This has been reflected in the longevity assumptions set by actuaries at successive valuations, which have often led to an increase in the value of the past service liabilities and higher contribution rates payable by employers, as improvements outstrip expectations.

However, death experience in recent years has bucked the trend. Evidence from Club Vita, our specialist longevity consulting company, tells us that there have been more deaths of LGPS pensioners than expected since 2016. We would therefore anticipate there to be fewer pensions in payment in 2019 than expected. This will, for a typical scheme, lead to a reduction in liabilities at the 2019 valuation (although the actual effect will vary across different funds and employers depending on the actual experience of their members).

The increase in deaths at the population level over recent years has been attributed to a range of different factors², including limited scope for future improvements in cardio-vascular mortality (after decades of falling rates), increases in deaths attributable to dementia and an increasingly frail elderly population. Some commentators have recently suggested that changes in the amount and availability of health and social care, linked to austerity policies, may also be a contributing factor.

Baseline longevity

The effect of recent experience will be reflected and allowed for (in part) in the 2019 valuation baseline longevity assumption. As the Fund is a member of Club Vita it benefits from a greater understanding of longevity risk, we recommend that the baseline longevity assumptions to adopt at this valuation are a bespoke set of VitaCurves that are specifically tailored to fit the membership profile (based on age, sex, affluence, retirement health and occupation) of the Fund. These curves are based on data the Fund provides us for the purposes of the valuation. This method is more accurate than trying to fit standard mortality tables to reflect the Fund's membership.

Further details regarding how these longevity assumptions are derived can be found in the report entitled "Tailoring Vita Curves to the Lincolnshire Pension Fund", which was issued to the Administering Authority.

Evidence has shown over the years that this assumption closely reflects the actual experience of LGPS funds, meaning that there are rarely any significant surprises in terms of the financial effect of baseline mortality. This is the same approach that was adopted at the 2016 valuation.

Future improvements

As mentioned above, recent evidence suggests that death rates were higher than expected based on the trend over the previous decade. This may strengthen the view that we are seeing the beginnings of a new trend. However it is not totally conclusive.

¹ LGPS Longevity Index has been developed as a joint venture between Hymans Robertson, Club Vita and the Local Government Association

² See

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/786515/Recent_trends_in_mortality_in_England.pdf

The headlines about the slowdown in life expectancy improvements have been based on national population data. Therefore, we need to understand the extent to which this apparent change in trend in general population data is relevant to LGPS funds' membership. Recent analysis from Club Vita has shown that in fact not all pensioners have seen a similar downturn in life expectancy improvements over recent years. In particular, the more affluent members (those with high pensions or living in affluent areas) appear to have seen less of a downturn in the rate of increase of life expectancy. Given such members will typically represent a reasonable proportion of the Fund's liabilities, we would be cautious about assuming future improvements will follow the same trajectory as the general population.

The 2016 assumption for future longevity improvements was based on a 'wait and see' approach. This was on the basis that:

- The longevity risk faced by funds is mitigated in part by the link between Normal Retirement Age and State Pension Age for future service benefits (which in turn, is expected to increase in the future in line with increases in life expectancy);
- The LGPS 'employer cost cap' includes longevity as a cost control mechanism, thus mitigating the impact of future longevity improvements; and
- Local authority funds have a long-term time horizon over which to fund improvements in longevity if they emerge.

As such we based our 2016 assumption on the 2013 version of the Continuous Mortality Investigation (CMI) longevity improvements model, which is published by the Actuarial Profession, and allowed only for data up to 2014, rather than the heavier experience of more recent years, when setting initial rates of improvement. We assumed that these improvements would immediately start to tail off to a long-term rate of 1.25% p.a.

Our recommended assumption for the 2019 valuation will be based on the latest available version of the CMI longevity improvements model. This version includes a number of structural changes compared to previous versions of the model – in part due to concerns around sensitivity to recent experience. This model is built using England & Wales population data to estimate current rates of improvement. As such, simply moving to this version of the CMI model would reflect recent heavy experience in the short term.

Given that there remains some uncertainty around whether there is sufficient evidence to conclude that recent heavier than expected mortality experience is the start of a new trend, and the extent to which any such change in trend at the general population level would be relevant for the specific membership of the Fund, we recommend adjusting the model to reduce the impact of the last few years of observed heavy mortality experience. This is in line with the 'wait and see' approach adopted at the 2016 valuation and reflects the very long-term nature of the Fund.

Our view of the longer term is unchanged; therefore, we recommend retaining the assumption for the long-term rate of improvements of 1.25% p.a. (equivalent to around an extra 1 month of life expectancy per year). In addition, we recommend that this long term rate will tail off above age 90, down to 0% at age 120, in line with the assumption at the previous valuation.

Overall, we would describe the recommended assumptions as reflecting recent longevity experience whilst retaining a 'wait and see' approach on the future (as we continue to monitor how longevity experience for LGPS members evolves over time) in order to avoid understating the likely rates of improvement.

Recommended assumption

Baseline: bespoke VitaCurves set at individual member level

Future improvements: latest version of the CMI model, adjusted to dampen the impact of recent heavier than expected mortality, long term improvement rate of 1.25% p.a.

Retirement demographics

Assumptions such as the rate at which members are assumed to leave local government employment with a deferred pension and the assumed incidence of ill-health early retirements affect the assessed cost of benefits accrued to date ("past service liabilities") and the cost of benefits accrued in future ("future service rate").

The starting point for our proposed 2019 valuation assumptions was to analyse past experience over the period 1 April 2013 to 31 March 2016 for all the LGPS funds that Hymans Robertson advises (40 funds in England & Wales). We use such a large data set to give us a big enough sample size for our analysis to be statistically credible. Some of the experience we analyse is rare, therefore we need a sufficiently large number of events to enable credible analysis.

Withdrawals (excluding ill health)

The rate of withdrawal only affects final salary liabilities, as CARE benefits are revalued in the same way for active and deferred members (both in line with CPI). Based on our analysis of withdrawal experience from 2013 to 2016 at a national level we have made small increases to the likelihood of withdrawals at each age, so our assumption better reflects recent experience.

Ill health early retirements

The national analysis carried out for the 2019 valuation suggests that the incidence of ill-health retirements is lower than expected at 2016. Therefore, we have lowered the national assumption for the 2019 valuation which will result in slightly lower contribution rates.

Promotional salary scale

As mentioned earlier, our assumption for pay growth has historically been split into general inflationary pay increases and promotional pay growth. At the 2016 valuation we used the same promotional pay scale for all members i.e. there is no split between men/women, full-time/part-time employees and officers/manual workers. The national analysis carried out for the 2019 valuation does not suggest that any change is required to the salary scale used for the 2016 valuation.

Death in service

The incidence of death in service is very low. Our analysis at national level for the period 2013 to 2016 was very similar to the 2016 valuation assumption. Therefore, we have not made any change from the assumption used for the previous valuation.

50:50 take-up option

From 1 April 2014, members have been able to elect to pay half the standard level of contributions for half the accrued benefit (i.e. an accrual rate of 1/98). This option affects future service only (past service is protected) and the employer's cost will fall as a result of members choosing this option. This benefit is known as the *50:50 benefit*.

At the 2016 valuation we assumed that 2% of members (uniformly distributed across the age, service and salary range) would choose to take up the 50:50 option. This was agreed by considering the actual Fund take-up at 2016.

As far as we are aware, and based on our analysis, there has not been any noticeable uptake in the 50:50 option nationwide. It is not still not clear whether take-up will remain low or increase in future due to the impact of more awareness campaigns and lower tax allowances. This assumption will be reviewed again once the final membership data is received.

Other demographic assumptions

In light of our analysis, at the 2019 valuation we propose no change to assumptions (compared to 2016) regarding:

- Allowance for dependant's benefits
- Recommended cash commutation assumption of 50% of HMRC limits for service to 1 April 2008 and 75% of HMRC limits for service from 1 April 2008 (if the Fund wishes, we can carry out analyse to examine commutation take-up and amend if appropriate).

At the 2016 valuation, our retirement age assumption was set to mirror the assumption used by the Government Actuary's Department for the purpose of costing the LGPS 2014 scheme. GAD have recently updated this assumption in light of emerging experience based on analysis of data at national level. We will update our assumption in line with these changes (this will have minimal impact on the past service liabilities or future cost of benefits).

Reliances and limitations

This information is addressed to Lincolnshire County Council as Administering Authority to the Lincolnshire Pension Fund. It has been prepared in our capacity as actuaries to the Fund and is solely for the purpose of discussing the proposed assumptions for the 2019 formal valuation. It has not been prepared for any other purpose and should not be used for any other purpose.

The Administering Authority is the only user of this advice. Neither we nor Hymans Robertson LLP accept any liability to any party other than the Administering Authority unless we have expressly accepted such liability in writing. The advice or any part of it must not be disclosed or released in any medium to any other third party without our prior written consent. In circumstances where disclosure is permitted, the advice may only be released or otherwise disclosed in its entirety fully disclosing the basis upon which it has been produced (including any and all limitations, caveats or qualifications).

The following Technical Actuarial Standards are applicable in relation to this advice, and have been complied with where material and to a proportionate degree:

TAS100; and

TAS300.



Peter Summers FFA

Fund Actuary

27 June 2019

For and on behalf of Hymans Robertson LLP

This page is intentionally left blank