

# **A BRIEF GUIDE TO LGPS ACTUARIAL VALUATIONS AND FUNDING**

## Why do a valuation?

- It is a statutory requirement for a valuation to be carried out every 3 years.
- To monitor the assets against the current value of the liability of the pension benefits earned to date (is there a surplus or deficit?)
- To review the employers' contribution rates. This review will take into account the Funding Strategy assumptions and principles adopted by the Fund including any Deficit Recovery Plan, and also the Investment Strategy and structure of the Fund. The employers themselves will also be consulted about the Funding Strategy as part of the review.

## What is included in the Funding Strategy?

- In line with the Regulations, the Fund will have a Funding Strategy Statement (FSS) in place which is reviewed by the administering authority at each actuarial valuation.
- The FSS will set out the underlying assumptions and principles that are to be adopted when valuing the Fund's liabilities and setting contribution rates.
- In addition, given that there are different types of employers within each Fund (e.g. scheduled bodies, admitted bodies etc) and the fact that different employers will have different objectives, the FSS will also need to address how any specific employer issues should impact on the assessment of required contributions. The main issue to be addressed is the strength of the ultimate covenant of each employer e.g. whether any guarantors exist, the likelihood of premature withdrawal from the Fund etc.
- Other issues that need to be addressed in the FSS include the overall time horizon for the Funding Plan, the link between the funding strategy and the investment strategy, the risks inherent within the funding strategy, and also how the strategy is to be monitored and reviewed.

## What are the pension benefits?

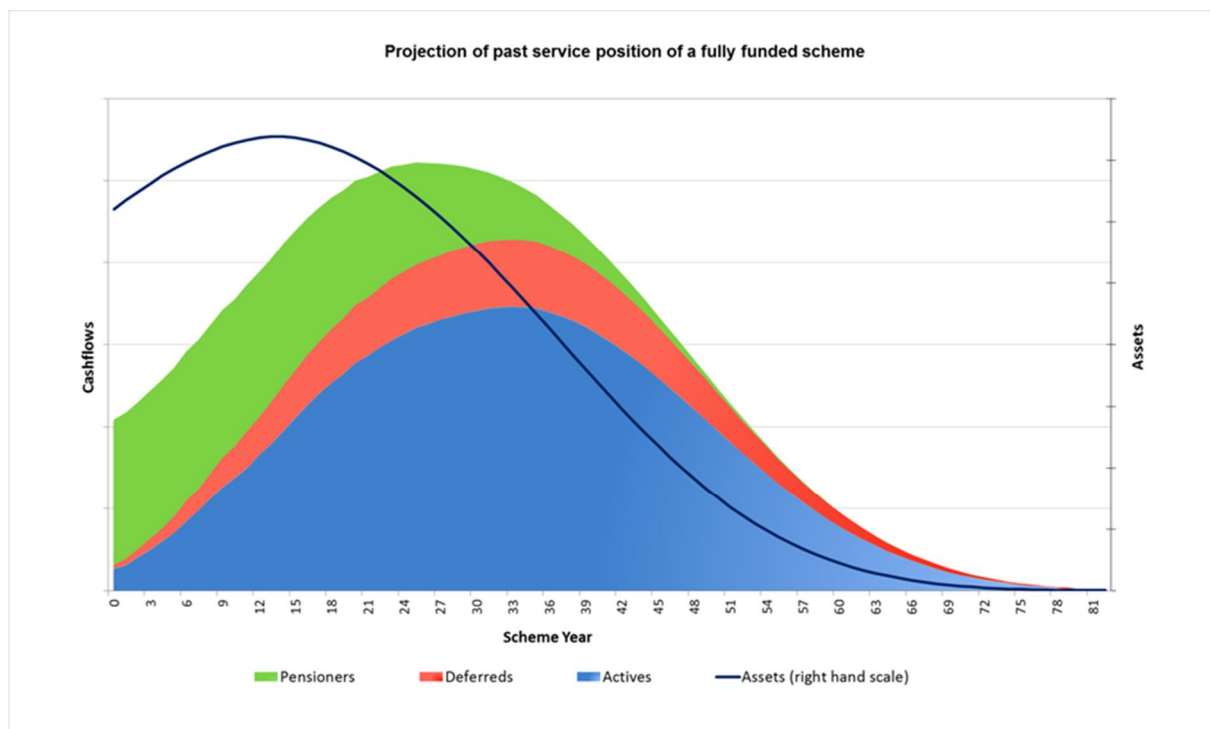
- The benefits earned under the LGPS changed with effect from 1 April 2014. Members will have Final Salary benefits for service earned prior to 1 April 2014 and Career Average Revalued Earnings (“CARE”) benefits accruing on or after this date. The benefit structure of the scheme previously changed with effect from April 2008. A summary of the main retirement benefits offered by the Scheme is shown below.

	Pension	Lump Sum
For service pre 1 April 2008	$1/80 \times \text{salary at retirement} \times \text{service}$	$3/80 \times \text{salary at retirement} \times \text{service}$
For service from 1 April 2008 to 31 March 2014	$1/60 \times \text{salary at retirement} \times \text{service}$	By commutation of pension only
For service post 31 March 2014	For each year of service: $1/49 \times \text{salary earned during the year.}$ Pension increased to retirement in line with CPI inflation	By commutation of pension only

- In addition to the above pension and lump sum benefits, the LGPS also provides spouses’ and other ancillary benefits.
- As part of the benefit structure changes with effect from 1 April 2014, there is a 50:50 option available to members whereby they can opt to receive 50% of the standard Fund benefits in return for paying 50% of the standard employee contributions.

## What do we mean by liabilities?

- The liabilities of the Fund at the valuation date are defined as the sum of the discounted value of all future benefit payments (in respect of service to the valuation date – Past Service) i.e. what money does the Fund need to have at the valuation date to meet the projected cost of the accrued benefits coming into payment. An illustration of the typical expected benefit cashflows are shown below:



- The liabilities of the Fund cover members currently in service (Active Members), members who have left service but not yet retired (Deferred Pensioners), and members in receipt of their benefits (Current Pensioners).

## How do we value the liabilities?

To value the liabilities, we need to take into account the following:

### Financial Assumptions

- The investment return we can assume to achieve on the assets (Discount Rate) – affects how much we need to hold now to provide the benefits in the future. The higher the assumed rate of interest, the less we have to hold now;
- The rate at which salaries will increase in future because pensions earned prior to 1 April 2014 are based on salaries at retirement, death or leaving;
- Future price inflation because this affects salary increases, pension increases and the rate at which the CARE pensions earned after 31 March 2014 increase in the future (up to retirement);

### Demographic Assumptions

- The probability that pensions will be paid and under what circumstances (e.g. death, deferred pension, early (voluntary and ill-health) and normal retirement); and
- How long pensions are likely to be in payment for (Life Expectancy or Mortality Assumption).
- Other demographic assumptions taken into account include the level of take up of commutation of pension for additional lump sum, the proportion of members that are married, and the age difference between members and their partners.

## How does the calculation of liabilities work?

- In the simple case of a retirement lump sum which is related to salary and service at retirement (service before 2008 in the LGPS), the value of the accrued liability at the valuation date would be calculated as follows:

$$\text{Relevant Service} \times \frac{3}{80} \times \text{Salary at Valuation} \times \text{Salary Inflation to retirement} \times \text{Probability of remaining in the Scheme until retirement} \times \text{Discount factor for period between valuation date and retirement}$$

*This value therefore represents the amount of cash that would need to be held at the valuation date to cover the projected cost of the lump sum at retirement allowing for the probability of actually having to pay it.*

- All other benefits are valued in much the same way taking into account their probability of payment and the relevant indexation prior to payment. Pension payments are valued taking into account the expected period of payment (Life Expectancy / Mortality Assumption), the appropriate discount rate whilst in payment and an allowance for pension increases. The sum of all these calculations gives the Past Service Liabilities.
- Numerical illustrations of discounting and the sensitivity to assumptions are shown in Appendix 1.

## How are deficits recovered?

- If there is a shortfall of assets at the valuation date when assessed against the value placed on the liabilities, deficit recovery contributions will become payable.
- The main factors which will affect the deficit recovery contributions include the length of the Recovery Period (the longer the period, the lower the required contribution), and also the rate of return on assets and contributions assumed to apply during this period, which may differ from the Discount Rate used to assess the liabilities (the higher the assumed investment return, the lower the required contribution). In the same way as the total interest payable on a loan will be less if the term of the loan is shorter, the total interest payable on the deficit is less for a shorter deficit recovery period than for a longer one.
- The contributions may be expressed as an additional percentage of salaries, or as lump sum payments that are fixed or index-linked in nature.

- The Deficit Recovery Plan of the Fund will be included within the Funding Strategy Statement.

## **What about the funding positions of individual employers?**

- The fundamental principle adopted in the setting of individual employer contribution rates is the “no cross subsidy” principle. In practical terms this means that for most employers in the Fund the actuarial calculations seek to identify notional sub-funds (i.e. assets and liabilities) pertaining to each participating employer, and to track these at each full valuation.
- Whilst this tracking is necessarily to a degree approximate and the assets are not physically split between employers (for example there is no formal, auditable, tracking of individual employers’ asset allocations) the actuarial processes are designed to give the same overall effect.
- The relative allocations of assets and liabilities within the Fund to any one employer, as identified at a valuation, will then reflect the specifics of membership, experience (e.g. pay growth, ill health retirements etc.), and past history (e.g. assets accumulated up to the prior valuation, actual contributions paid etc.) for each employer.
- All employers are normally assumed to have the same investment policy and so generally the employer’s split between the various asset categories is taken to be the same as for the whole fund.
- The result of this process is therefore a notional surplus or deficit position for each employer, which will be reflected in setting contributions at the valuation.

## **What are the main factors that could impact on a change in deficit since the last valuation?**

- Any changes to the financial and demographic assumptions illustrated above will affect the valuation outcomes for each employer i.e. impact on the change in deficit since the last valuation.

- In addition, all employers in the Fund will be affected by the investment performance of the Fund as a whole over the inter-valuation period, which has a significant bearing on the notional asset value identified at the valuation date for the employer, and hence any deficit and consequent deficit recovery contributions that become payable.
- However, alongside the factors above which affect every employer in a similar manner, membership “experience” during the inter-valuation period will differ from employer to employer and may have a positive or negative impact on the deficit assessed for the employer from one valuation to the next. For smaller employers in the Fund (in terms of membership size) “experience” can potentially have a significant impact on funding, more so than for larger employers where positive/negative experience is likely to be less material because of averaging effects over the larger membership.
- Appendix 2 gives a brief explanation of the most common examples of membership “experience” and how they could impact on the funding positions for employers between actuarial valuations (focussing on “smaller” employers in particular).
- Alongside the above, there are other factors which may influence how an employer’s funding position changes between actuarial valuations. One such factor is the deficit recovery plan implemented at the prior valuation e.g. all other things being equal, the funding position between valuations will change to a larger degree if a 5 and not 20 year recovery period was previously implemented. Other factors also include the impact of events specific to the employer e.g. redundancy exercises, bulk transfers etc.
- As part of the actuarial valuation process, employers were given an individual schedule which included a reconciliation of the movement in their funding position since the previous actuarial valuation (or inception in the case of new employers). This highlighted the main factors that had impacted on each employer.

## **What about future benefit costs accruing?**

- The Future Service Cost follows a similar calculation to that of the Past Service Cost but instead we look at the cost of just one year of service for the existing membership only and express this cost as a percentage of salaries at the valuation date.



- This is known as the Projected Unit method of calculating the contribution rate. It implicitly assumes a stable population and therefore a flow of new entrants to the scheme replacing leavers and retirees etc. The resulting percentage is adjusted for death in service costs, expenses and member contributions to arrive at the required future service employer contribution rate before allowance for surplus or deficit contribution adjustments as described above.
- The calculations for individual employer future service costs will follow a similar pattern above, based on the specific membership and funding position of the employer. Some employers in the Fund may operate closed memberships i.e. new entrants are not allowed to join the Fund. In such cases, the future service cost is identified by looking at the average cost of benefit accrual over the future working lifetimes of the current membership and not just the cost over one year. This is known as the Attained Age method of calculating the contribution rate.
- The Future Service Cost has been affected by the changes to the LGPS with effect from 1 April 2014. The impact on individual employers varies depending on the profile of their membership. Whilst this has given rise to a reduced cost for most employers, for some it can result in an increased cost. Employee contributions have also been updated as part of the change in benefit structure.

## Some Facts

- Gilts are a good match to pensions in payment because they provide a guaranteed stream of income (and maturity proceeds) that can be used to meet pension payments. Index-linked gilts provide an income stream which copes with increasing pension payments which increase in line with RPI inflation. Currently there are very few investments which exactly match CPI inflation increases, and index-linked gilts are the best proxy at the current time.
- The difference in yields between fixed interest and index-linked gilts represents the investment market's view of long term future retail price inflation. This would typically be used as a starting point to assess the level of future RPI price inflation adopted in the valuation calculations (on which pension increases and salary growth are based).
- The assumption for pension increases is lower than the above RPI calculation. This is due to distortions in the index-linked market (caused by an imbalance in the supply and demand of stocks) and an adjustment to RPI inflation to arrive at a CPI inflation assumption given benefits are linked to CPI inflation.

- Annuities bought in the market principally assume investment in UK Gilts which are regarded as a “risk free” investment and therefore generally yield a lower rate of return than other investments.
- The likely return on long-dated gilts bought today and held to maturity is historically low at approximately 3.5% per annum. Therefore, to provide a certain income stream requires a higher holding (in value terms) of gilts than would be required when yields were higher.
- The real yield on long dated index-linked gilts is historically low and the yield has been negative at various points, most noticeably at 31 March 2013. There is an ongoing debate as to the cause of this situation, and whether any reversion to previous higher yields might be expected to occur.
- LGPS Funds typically hold a significant proportion of their investments in equity and other return-seeking type investments.
- Equities and other investments carry more risk with no underlying guarantees. In return for the risk, investors expect, over the long term, to achieve a better return than the secure investment of gilts (although equities can exhibit much more short-term volatility). Over the course of the 20th Century, the average additional return on equity investment over gilts was 5.5% per annum. However, over recent periods, falls in equity markets along with strong returns on gilts have given rise to substantial deficits in LGPS funds. Equity markets have also continued to be volatile in recent periods.

## Building the Ongoing Funding Basis

As noted above, gilts are the best proxy asset match for pensions in payment. It is therefore appropriate to begin building the financial basis of the valuation from gilt yields and in particular yields from gilts of an appropriate duration for the liabilities of the scheme. This, together with the market level of expected inflation, provides an objective starting point.

The first subjective assumption to make is the level of price inflation to assume. The inflation assumption will be taken to be the investment market’s expectation for RPI inflation based on the difference between yields derived from conventional and index-linked UK Government gilts. An adjustment due to retirement pensions being increased annually by the change in the CPI rather than the RPI and to allow for supply/demand distortions in the bond market is then made. The level of adjustment to make is based on the most up to date information available from the Office of National Statistics; however, their view on the level of adjustment to apply has changed over time.

Another subjective assumption to make is that of salary inflation over and above price inflation. Statistics show that, historically, National Average Earnings increase at around 2-2½% per annum above inflation. However, it is usual also to take into account the circumstances of the Fund and its constituent employers concerned in making such an assumption. An example of this is the announcement made in relation to the restraint in public sector pay over the short-term.

The other subjective element of the basis is the asset out-performance assumption. This reflects the fact that the underlying assets of most LGPS funds are largely equity-based. The question is, to what extent do we make allowance for out-performance over gilts in the Discount Rate?

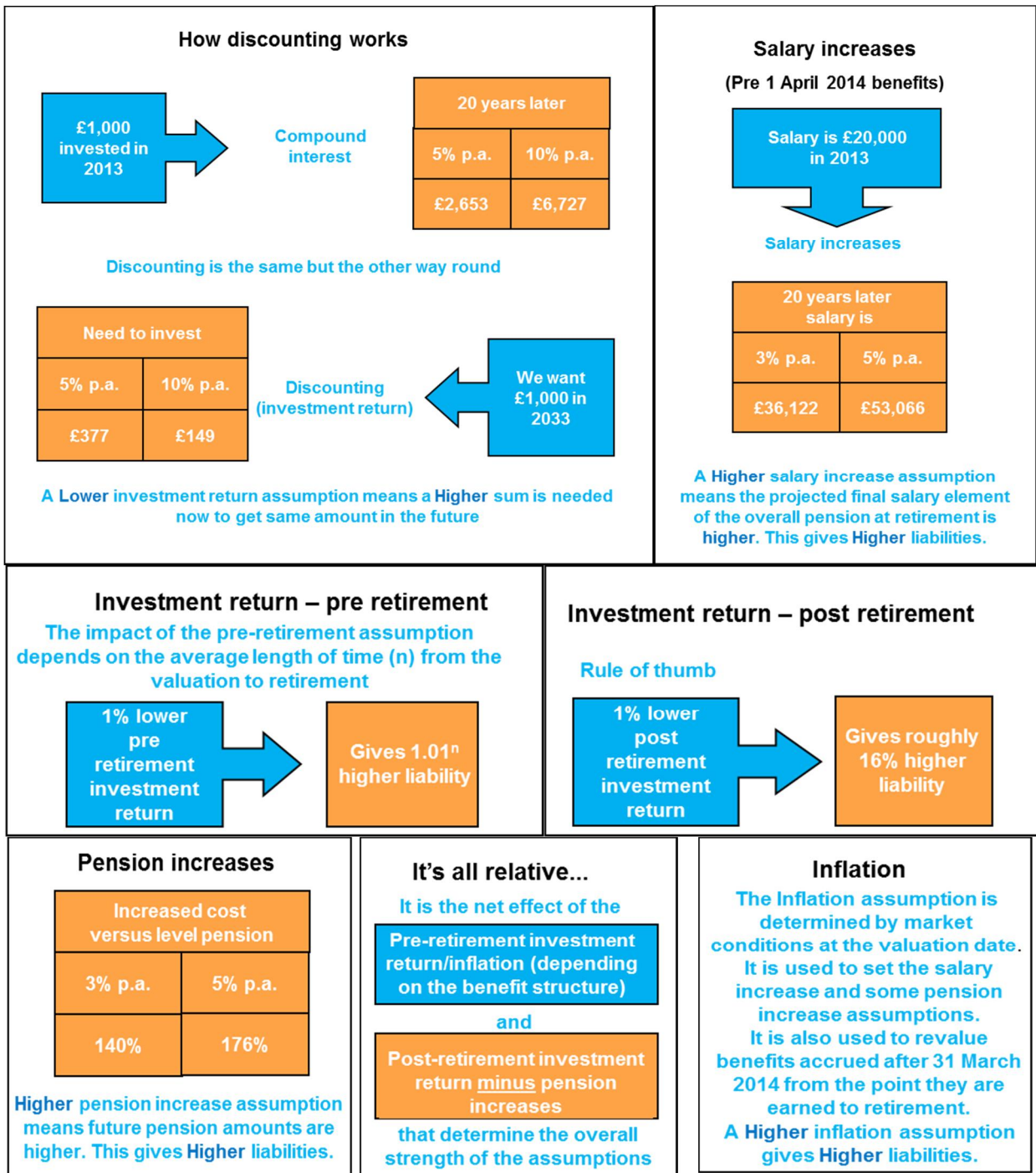
Returns on return-seeking assets are not guaranteed and in making an assumption about out-performance we are taking credit now for something that might not materialise. It is therefore less prudent to assume a high level of out-performance and vice-versa. A typical view would be to assume an additional return in the range of 1% to 2% per annum over gilt returns on average in the Funding Target (or asset coverage) adopted.

Additional expected returns would, in some circumstances be allowed for when considering the recovery plan for any valuation deficit. These additional returns would be closer to the “best estimate” returns expected from the Fund’s assets.

Schemes are not necessarily solely invested in return-seeking assets and may have gilts or bonds which go some way to matching the pensions in payment liability. It is therefore appropriate to take the scheme’s investment strategy into account when setting the Discount Rate.

## Appendix 1

### How discounting cash flows works and impact of other assumptions on liabilities



## Appendix 2

### Examples of membership “experience” that can occur between valuations which can impact on an employer’s funding position when assessed at the following valuation

Whilst the examples in this Appendix will affect all employers in the Fund, it is smaller employers (based on membership size) for whom the impact on funding position will be the greatest. For larger employers, positive/ negative membership experience is likely to be less material because of averaging effects over the larger membership.

The emergence of any funding “profit” or “strain” (decreased/increased) is principally determined by how the actual experience for an employer compares to the expected experience based on the **financial** and **demographic** assumptions adopted at the prior valuation. The factors below are those which typically have the largest impact. These are ill-health retirements, deaths (demographic factors) and also salary/pension increases (financial).

#### ILL HEALTH RETIREMENTS

Should a member retire on ill-health grounds during the inter-valuation period this will normally result in a funding strain for that employer (i.e. increased liability). The size of any funding strain will depend on how the actual cost of the ill-health retirement compares to the expected cost built into the valuation assumptions for that employer (as set out in the FSS). The actual cost will also depend on the level of any benefit enhancements awarded (which depend on the circumstances of the retirement) and also how early the benefits are brought into payment.

As an example, the actual cost of a 25 year old retiring in ill-health under “Tier 1” (the most serious under the current LGPS benefits structure) will be significantly higher than that of a 55 year old “Tier 1” retirement i.e. benefits being brought into payment a lot earlier, greater service enhancements. The funding strain for the employer would therefore be larger in such circumstances.

#### DEATHS

The financial impact of the benefits that become payable on the death of a member differ depending on whether the member dies before or after retirement.

The extent of any funding strain/profit which emerges on the death of a pensioner member (typically a profit) will be determined by the age of the pensioner at death and whether or not any dependants’ benefits become payable.

In the event of a member dying whilst in active service, it is not certain that a funding profit would emerge. Whilst the Fund would no longer have to pay the accrued benefits at retirement for the deceased member, a lump sum death grant and also dependants' benefits would become payable instead. The dependants' benefits would also be based on the pensionable service that the member could have accrued had they remained in service until retirement.

Typically, the death of a young, high paid member with low pensionable service and dependants is likely to result in a large funding strain for the employer. However, the death of an older, long serving, low paid member with no dependants could actually result in a funding profit.

### **SALARY / PENSION REVALUATION / PENSION INCREASES**

The financial assumptions adopted for a valuation will include those in respect of future salary increases, future revaluation and also pension increases (all linked to inflation). The extent to which the actual increases granted during the inter-valuation period differs compared to with expected levels will determine whether or not a funding strain/profit emerges. One key difference between the two is that employers will not have any control over the revaluation of pensions prior to retirement or pension increases after retirement, which are based on CPI inflation.

For example, if an employer does not award any salary increases over the period, this will have a beneficial effect on their funding position (in respect of service earned prior to 1 April 2014) at the following valuation i.e. funding profit. If inflation is higher than expected during the inter-valuation period, resulting in greater than expected pension revaluation and pension increases being awarded (both before and after retirement), a funding strain will occur.

### **OTHER EXPERIENCE FACTORS**

Whilst the above examples are the main types of experience which could have a significant effect on a small employer's funding position between valuations, there are other types of membership experience which could also occur, although for smaller employers the impact on funding would generally not be as great. These include:

**Leavers:** On final salary members leaving active service during an inter-valuation period and becoming entitled to a deferred benefit, a funding profit will typically occur. This will be because, in most cases, the salary increase assumption adopted for an actuarial valuation assessment will be higher than the corresponding inflation assumption. Therefore the retirement benefits payable to the deferred member are likely to be lower than had that member remained in active service (assuming the same retirement age for the members) given that inflation and not salary increases would be applied. The extent of any funding profit will be dependent on how the actual number of members leaving for a particular employer compares to the expected number incorporated into the valuation assumptions.

**Transfers:** In general, actuarial valuations assume that the incidence of any transfers paid out of the Fund, or service credits awarded on transfers paid into the Fund will be cost neutral. In the event that these do take place, there may be a funding strain/profit for an employer depending on any differences between the transfer and valuation assumptions. The extent of any funding strain/profit would depend on the volume of transfer activity for an employer over the inter-valuation period.

## Appendix 3

### Glossary of the terms used in the mortality assumptions

There are a number of technical terms used within this document and within the actuarial valuation report. A glossary of some of the key terms used is set out below.

#### Life expectancy

The average number of remaining years people at a particular age are expected to live. For example, a life expectancy at birth is the age to which people are expected to live; a life expectancy at age 65 of 20 means that 65 year olds are expected to live until they reach age 85. Life expectancy at any age is only an average figure and individuals will live to different ages.

#### Mortality rate

The probability of death over a fixed period. Lower mortality rates mean longer life expectancy.

#### Longevity

An alternative way of describing life expectancy.

#### CMI

CMI stands for the Continuous Mortality Investigation (CMI). The CMI is a body established by the actuarial profession to research mortality in the pensions and insurance industries.

#### AC00 mortality tables

This table is based on data collected by the CMI from insurers in respect of assured lives between 1999 and 2002. The name reflects that the centre point of the data set is 2000. Separate tables exist for males and females.



## Example post retirement mortality table

**106% of S1PA CMI\_2012 [1.5%] + 3 years.**

Each part of the name represents a feature of the table used:

- **106%** is the **weighting** applied to the actuarial table. This has the effect of increasing or reducing the chance of survival at each age, which increases or reduces the corresponding life expectancy. For example, a “106%” weighting would mean beneficiaries have mortality rates 6% higher than the unadjusted table which increases the assessed value of the corresponding liabilities.
- **S1PA** represents the ‘**SAPS**’ or ‘**SAPS S1**’ **series of tables** which is based on data collected by the Continuous Mortality Investigation from occupational pension schemes between 2000 and 2006. It is the most up to date series of published tables and the first based on pension scheme mortality data. A number of separate tables exist for males and females, and tables weighted by pension amount (‘amount tables’) and tables without any weighting (‘lives tables’), normal retirements and combined retirements (includes early and ill health) and tables based on all, high and low pension amounts.
- **CMI\_2012** is the **future improvement projections** being used and is a set of tables produced by the CMI. The reference to 2012 relates to the year of the version of the CMI annual improvement publication.
- **[1.5%]** is the **long term trend of the future mortality improvements** which is a reduction in the mortality rate over a period of time, in this case a 1.5% per annum improvement. Improvements in mortality rates lead to longer life expectancies for subsequent generations.
- **+ 3 years** represents the **age rating** that is applied to the actuarial table and has the effect of assuming that beneficiaries have a life expectancy equal to those older (or younger) than their actual age. For example, a “+3 years” rating would mean beneficiaries are assumed to have the mortality of someone three years their senior which has the effect of reducing their life expectancy and hence reducing the assessed value of the corresponding liabilities.
- The above table is a **Generational mortality table** which is a two-dimensional table of mortality rates that apply across a population based upon the year of birth of each member. For example the effect of a generational table for an individual with a year of birth 1960 is that the mortality rate at age 65 will be appropriate for someone reaching age 65 in 2025 (= 1960 + 65). Such tables contain survival probabilities for every combination of age and year of birth and thus take into account improvements in death rates through the years. Separate tables are usually used for males and females.



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