

# ACTUARIAL VALUATIONS AND UNDERSTANDING LIABILITIES

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Liverpool – Exchange Station

# Agenda



## ACTUARIAL VALUATION

- The purpose of an actuarial valuation
- Contribution outcomes
- Assumptions and liability calculations



## FUNDING STRATEGY

- Individual employers
- Funding Strategy Statement
- Deficit Recovery
- 2013 Valuation Update and Inter-Valuation Monitoring?



ACTUARIAL VALUATIONS

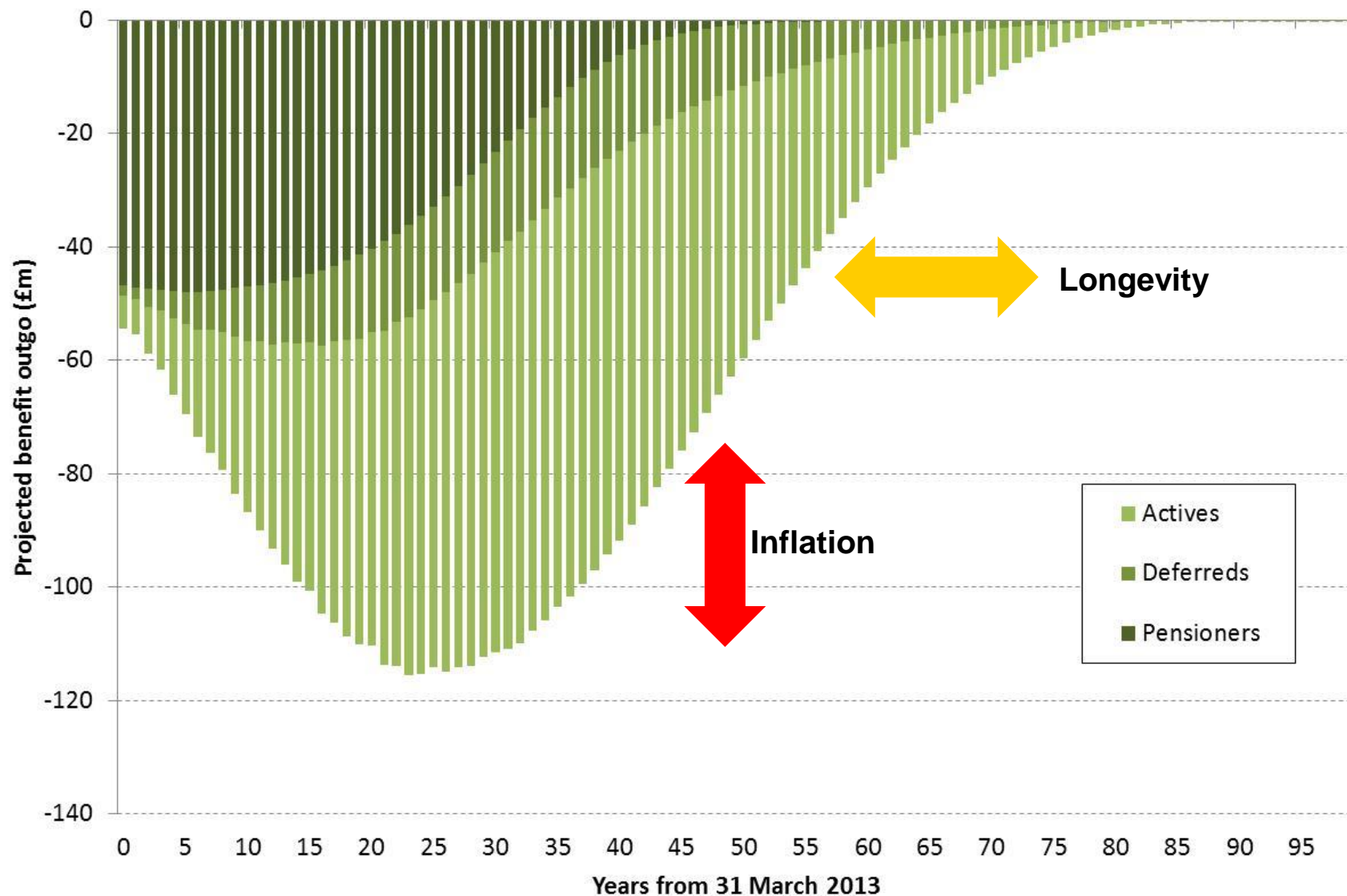
# THE PURPOSE OF AN ACTUARIAL VALUATION



# Purpose of an actuarial valuation

## Funding – It is all about benefit cash flows....

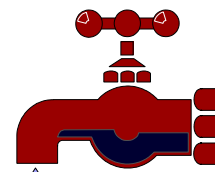
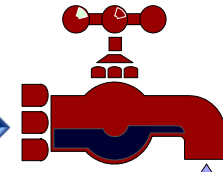
***Purpose***



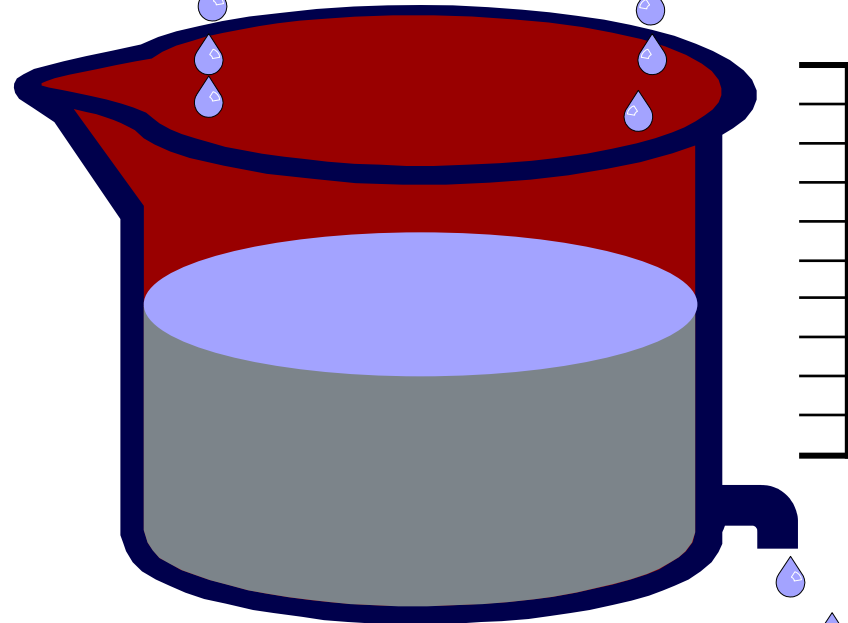
# Purpose of an actuarial valuation Defined Benefit Pension Scheme

*Purpose*

**Contributions**



**Investment Income**

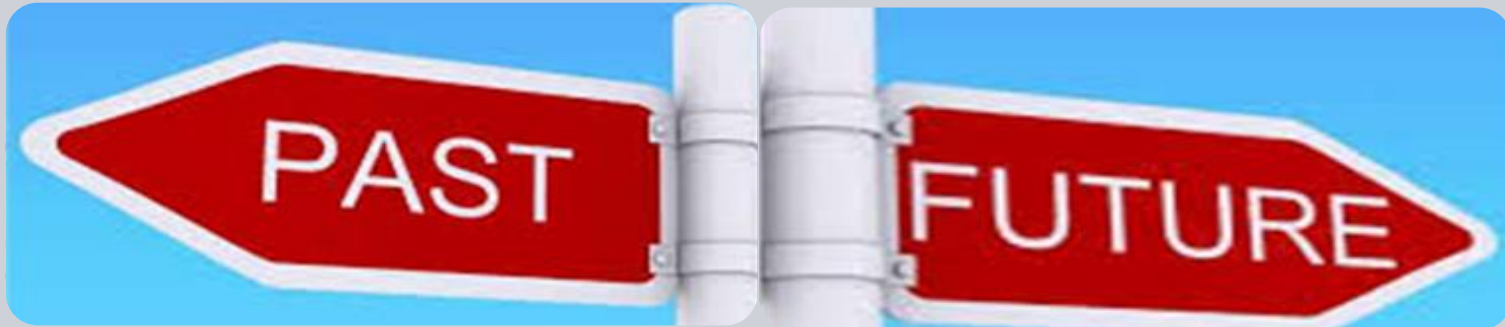


**Benefits**

# Purpose of an actuarial valuation

## Past and future benefits

***Purpose***



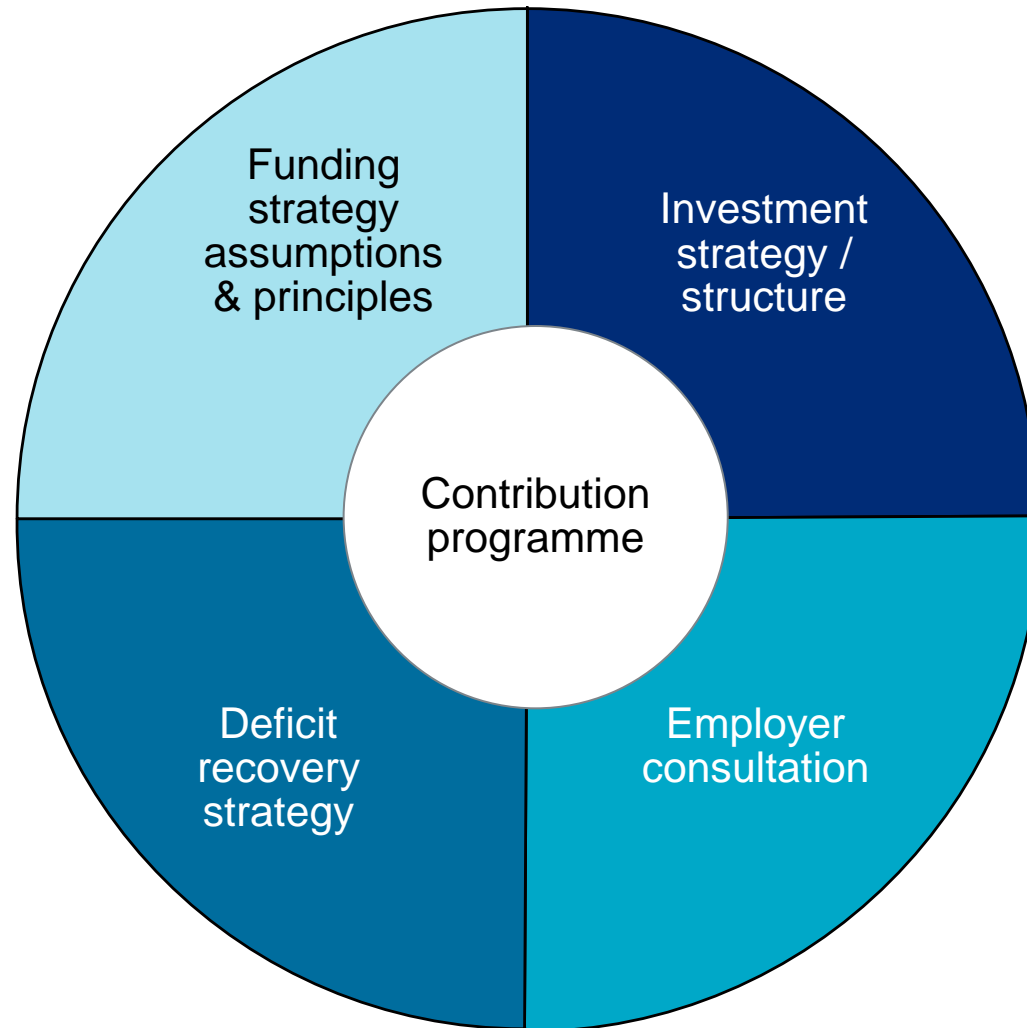
**Has the Scheme  
got enough assets  
to cover expected  
benefits built up to  
date?**

**How much will the  
University have to  
pay for benefits  
earned in the  
future?**

# Purpose of an actuarial valuation

## Review of contribution programme

***Purpose***





# Purpose of an actuarial valuation

## What about FRS17 / IAS19?

### ***Purpose***

**Funding basis not to be confused with Financial Reporting Standard 17 (FRS17) / International Accounting Standard 19 (IAS19) Assessment**

**Solely required to adhere to accounting disclosure requirements. Performed annually and disclosed in an Employer's accounts.**

**Assessed using a “prescribed” set of assumptions, which differ from those used in the actuarial valuation.**

**Does not impact of the Employer's contribution requirements.**



ACTUARIAL VALUATIONS

CONTRIBUTION OUTCOMES





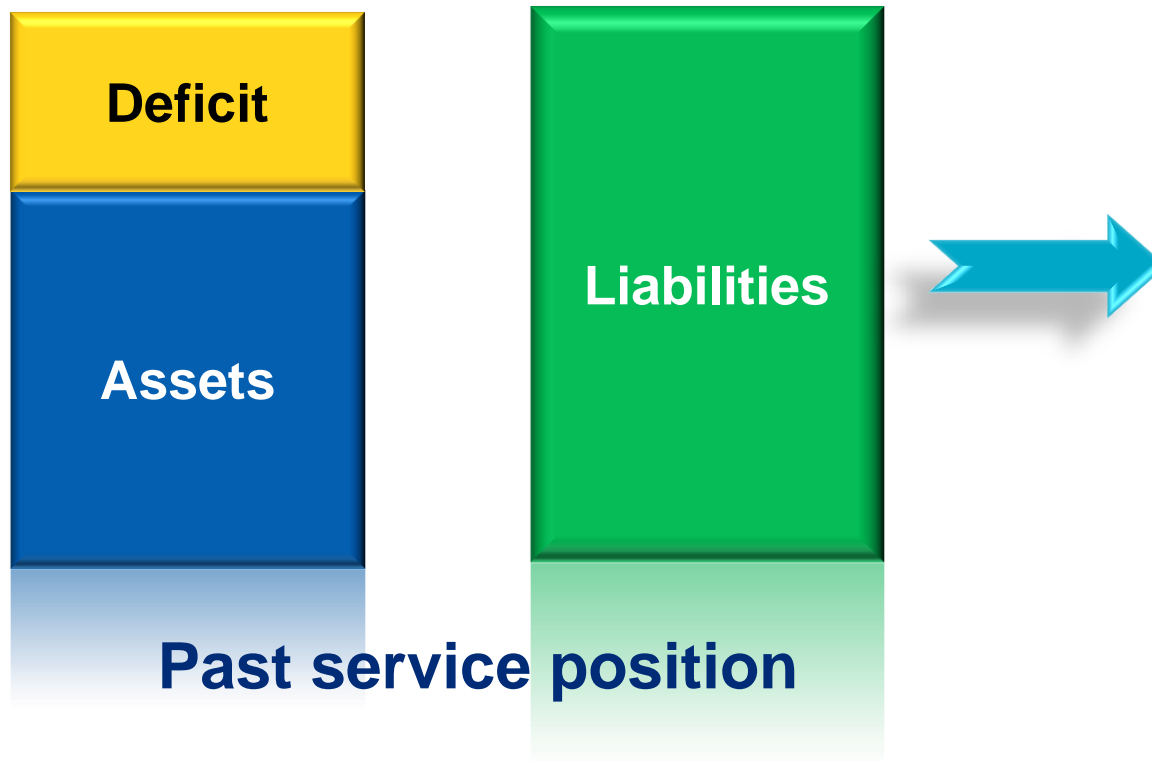
## CONTRIBUTIONS

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Cost of 1 year's  
service

**“Common  
Contribution Rate”**



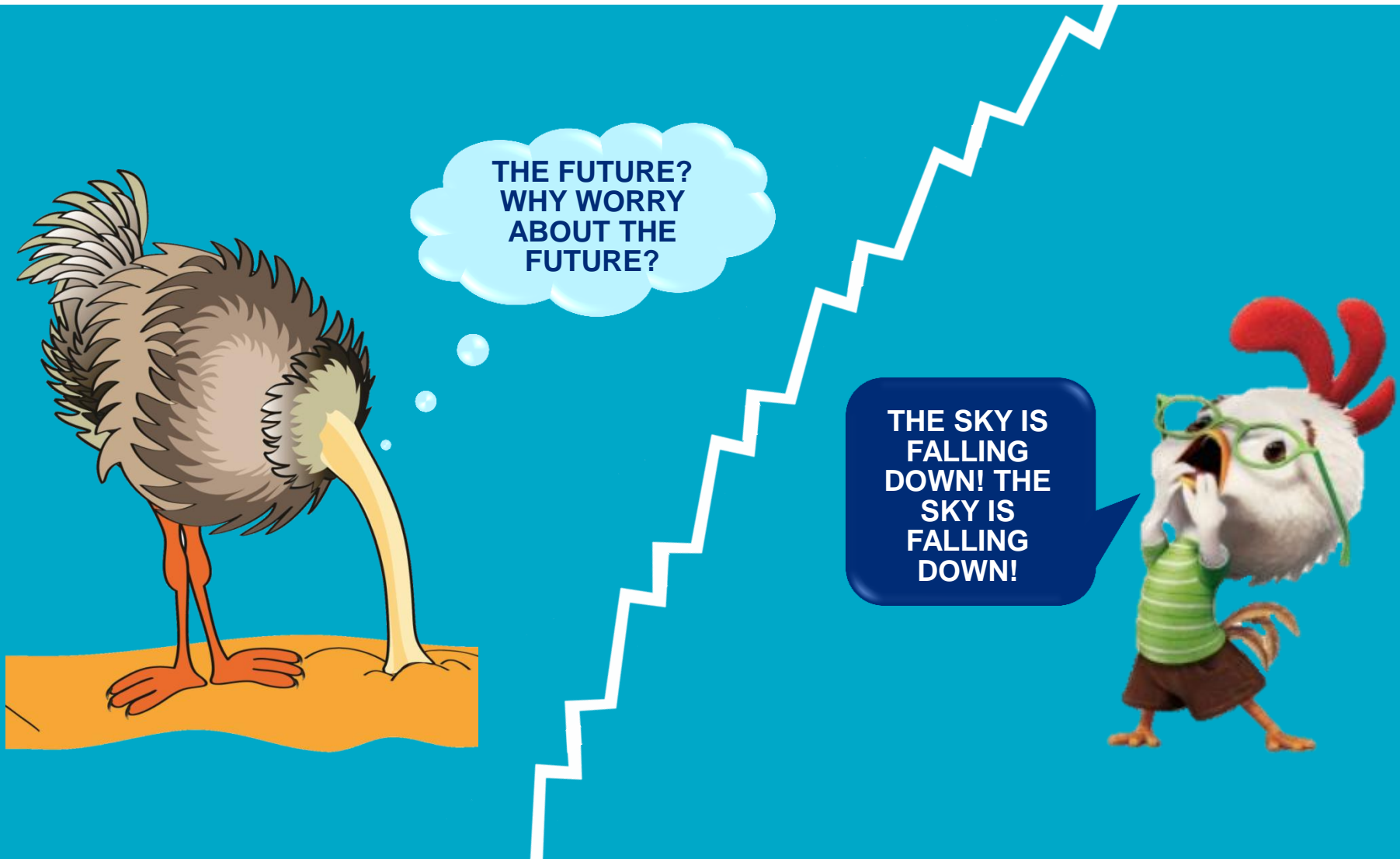
## CONTRIBUTIONS

What adjustment is required to the contribution rate to fund the deficit (or offset any surplus)

# Actuarial valuations

## Pace of funding – striking the right balance

Contribution  
outcomes



ACTUARIAL VALUATIONS

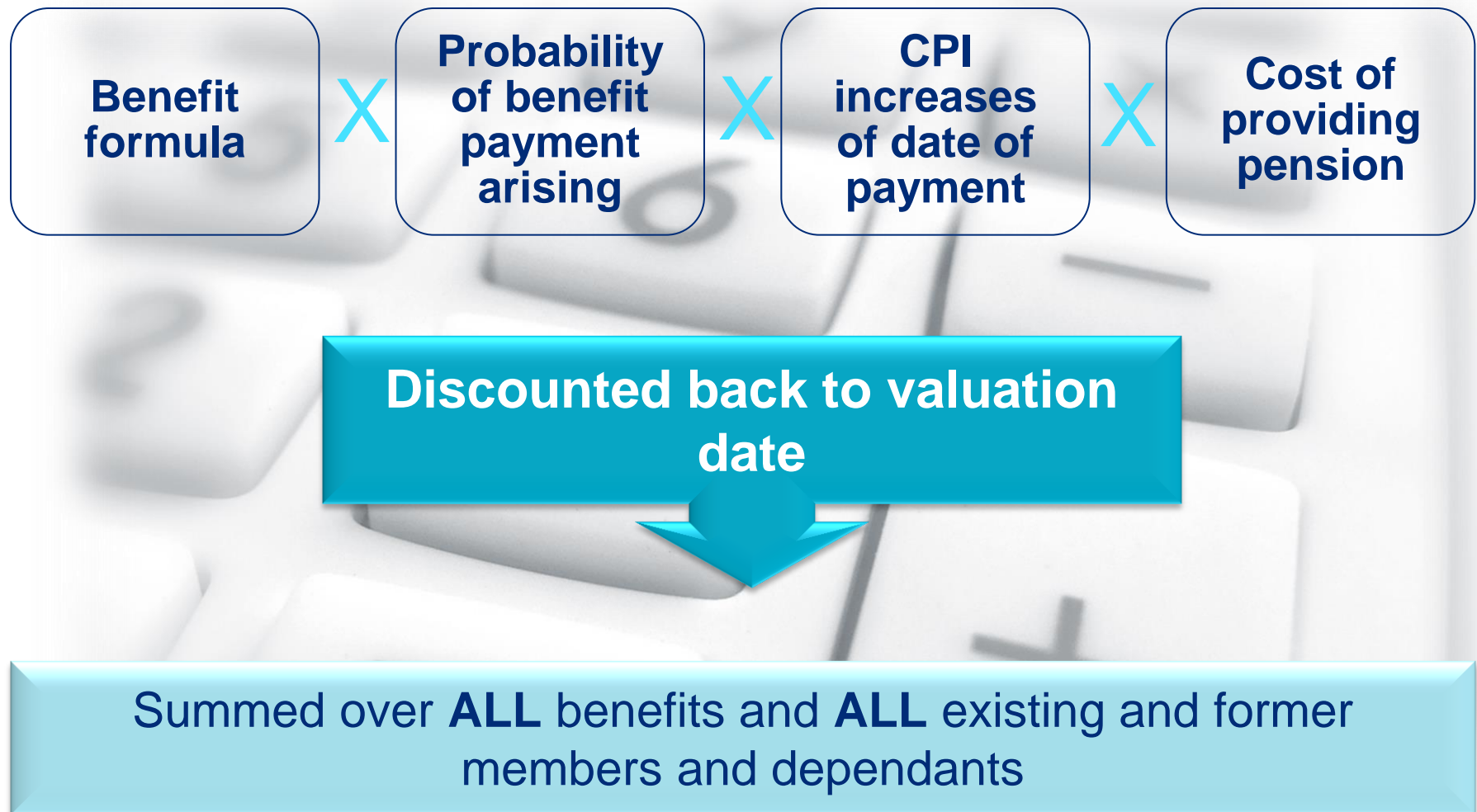
# ASSUMPTIONS AND LIABILITY CALCULATIONS



# Valuing pension benefits

## Basic principles

Liability  
calculations



# Assumptions

## Health Warning!!

A farmer asks an actuary to count the sheep in his field.

The Farmer

*“there are far too many of them and they all keep moving around, so I can’t count them properly”*

The Actuary’s reply

*“There are 3,004 sheep in the field”*

*“How do you know that asks the farmer?”*

*“Well, said the actuary, I assumed there are approximately 3,000 sheep in the middle of the field over there and added them to the 4 sheep in this corner here”!*

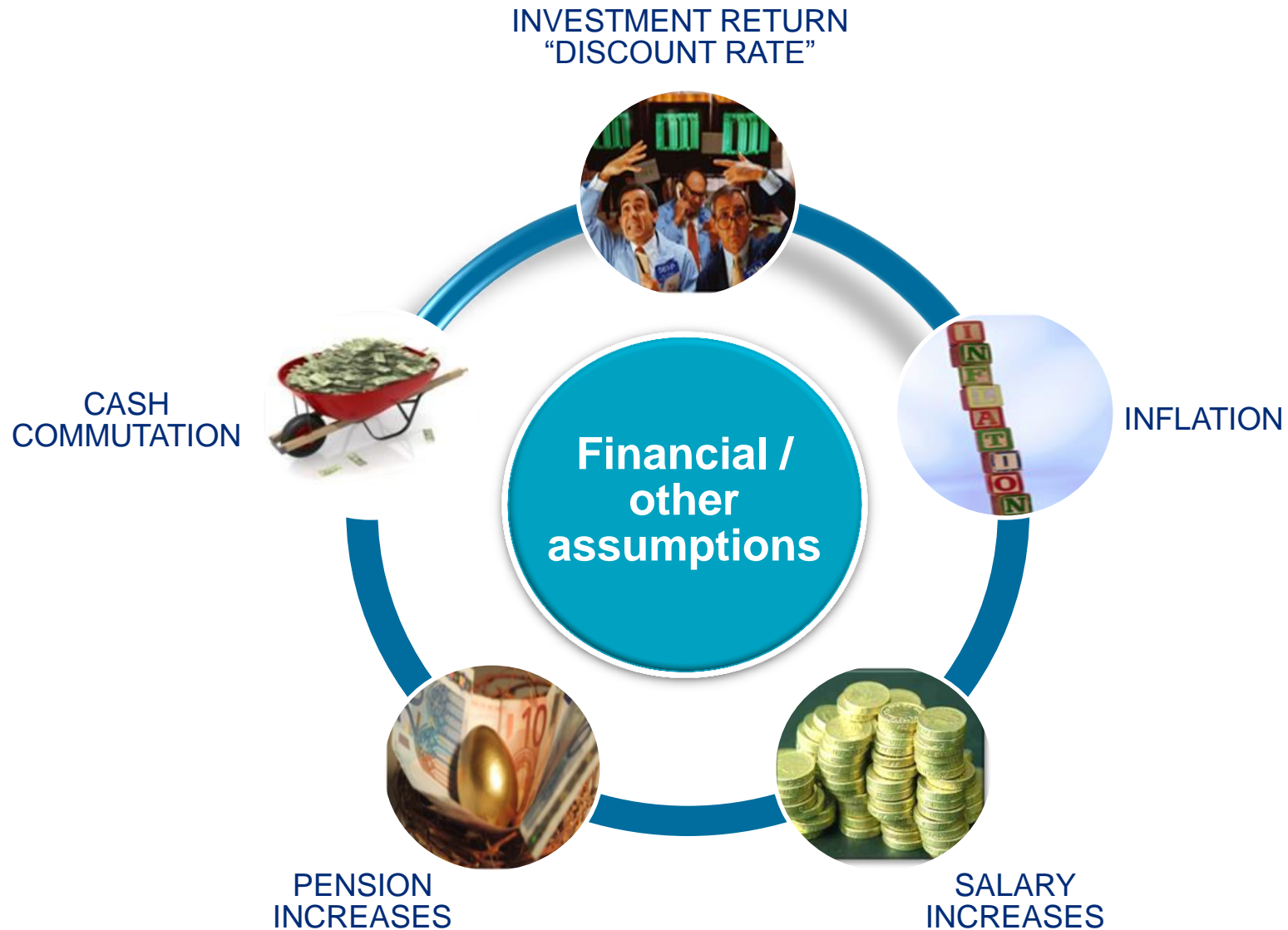




# Actuarial valuations

## Financial / other assumptions

Liability  
calculations



# Investment return / discount rate assumption

## An Example

Liability  
calculations

### PROMISE:

“IOU £100 in ten years time”

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### PLAN:

“I will put aside enough money to meet my promise”



### QUESTIONS:

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“How much?”

“Where do I invest it?”

*They depend on each other.*



# Setting Assumptions

## An Example

### Assumptions

THREE SAVINGS SCHEMES ARE OFFERED:-



#### SCHEME 1 UNDER THE MATTRESS

**Place £100 under the mattress and it will still be £100 in ten years' time.**



#### SCHEME 2 BOND

**Returning your money plus 40% interest in ten years' time**



#### SCHEME 3 GAMBLER

**Returning:**

- Money plus 100% with 50% chance
- Money plus 60% with 30% chance
- Money less 20% with 20% chance

# Setting Assumptions

## An Example

### Assumptions

THE EXPECTED RETURN OF THE THREE OPTIONS:-



SCHEME 1  
UNDER THE  
MATTRESS

0%



SCHEME 2  
BOND

40%



SCHEME 3  
GAMBLER

Probability	50%	30%	20%
Return	+100%	+60%	-20%
Expected return	+50%	+18%	-4%

64%

# Setting Assumptions

## An Example

### Assumptions

HOW MUCH DO YOU INVEST NOW?



SCHEME 1  
UNDER THE  
MATTRESS

£100



SCHEME 2  
BOND

£71.42



SCHEME 3  
GAMBLER

£60.98?

£50?

£62.50?

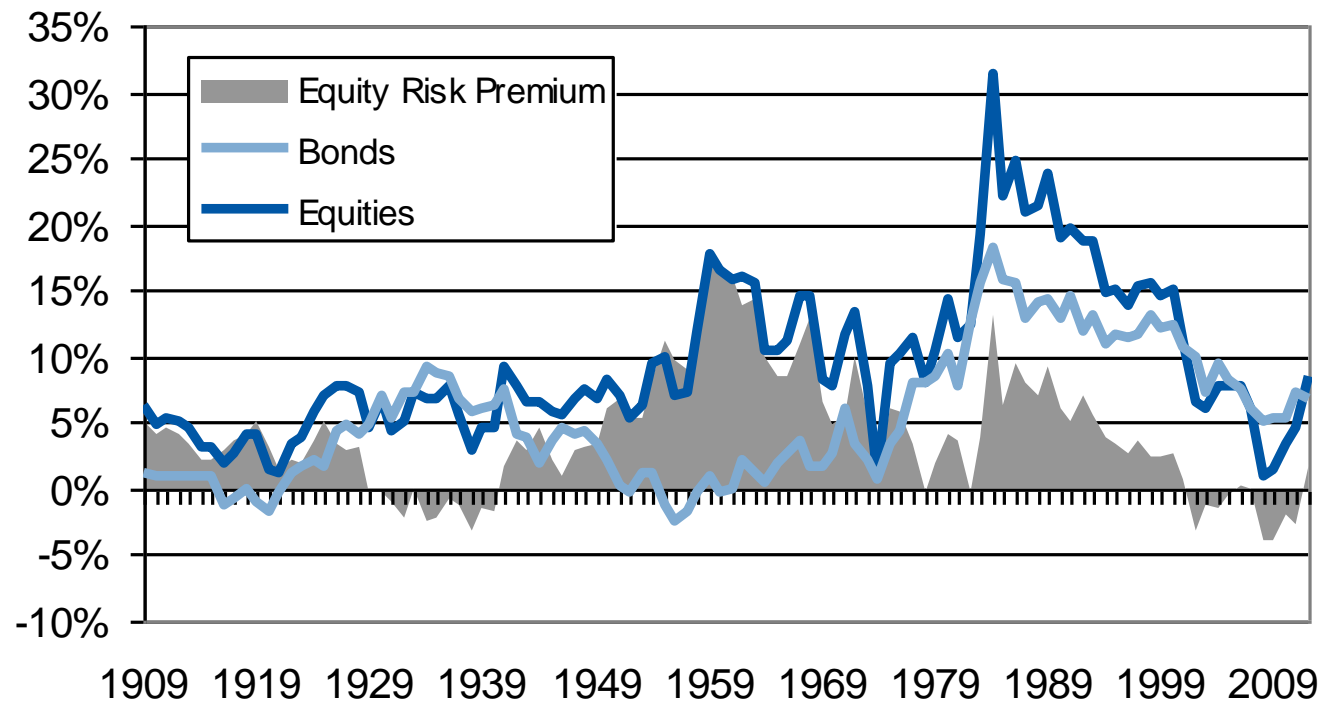
£125?

# LGPS actuarial valuations

## Typical investment return assumption

### Assumptions

Rolling 10 year returns



Typical out-performance assumption  
adopted of between 1% and 3% per annum

Equity Risk Premium (or 'outperformance') has been measured as the arithmetic difference in the geometric average rolling 10 year returns (based on Barclays indices).

Over the 113 year period to 2012 the average ERP was 3.8% p.a.

The chart below shows the ERP over rolling 10 year periods.

Over the past 100 years the ERP has been higher and lower than the average for sustained periods.



## Setting assumptions Price Inflation (used for pension increases)

### Assumptions

RPI – Retail Prices Index  
CPI – Consumer Prices Index



Market implied inflation (MII) derived from fixed interest  
and index-linked gilt yields



Adjustments to MII  
Inflation Risk Premium / CPI pension increases

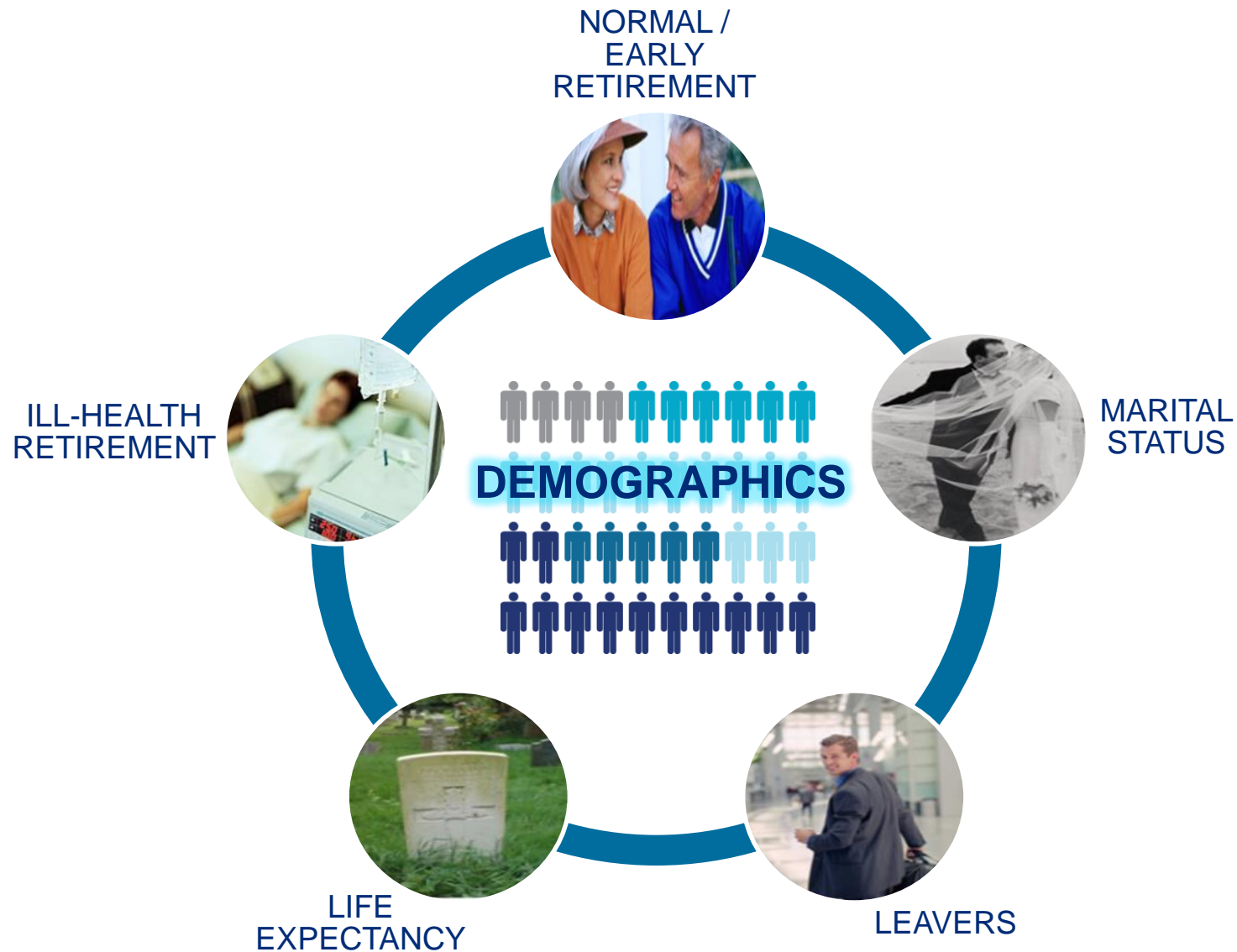
Currently, combined effect might lead to difference of 0.5% - 1.0% per annum i.e. **CPI assumption lower than MII by 0.5%- 1.0% each year long term.**



# Actuarial valuations

## Demographic assumptions

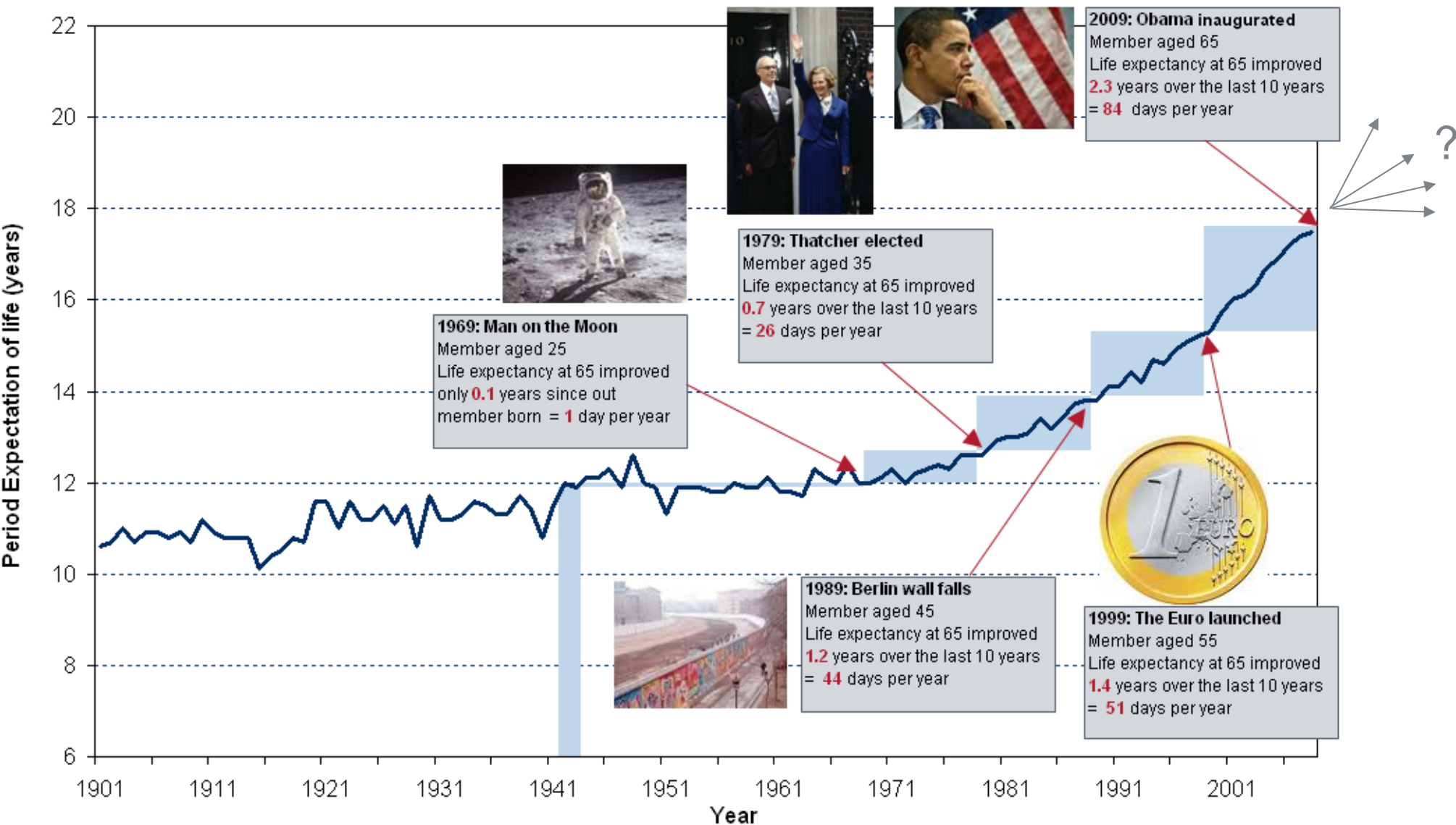
### Assumptions



# People are living longer

## Past improvements (males age 65)

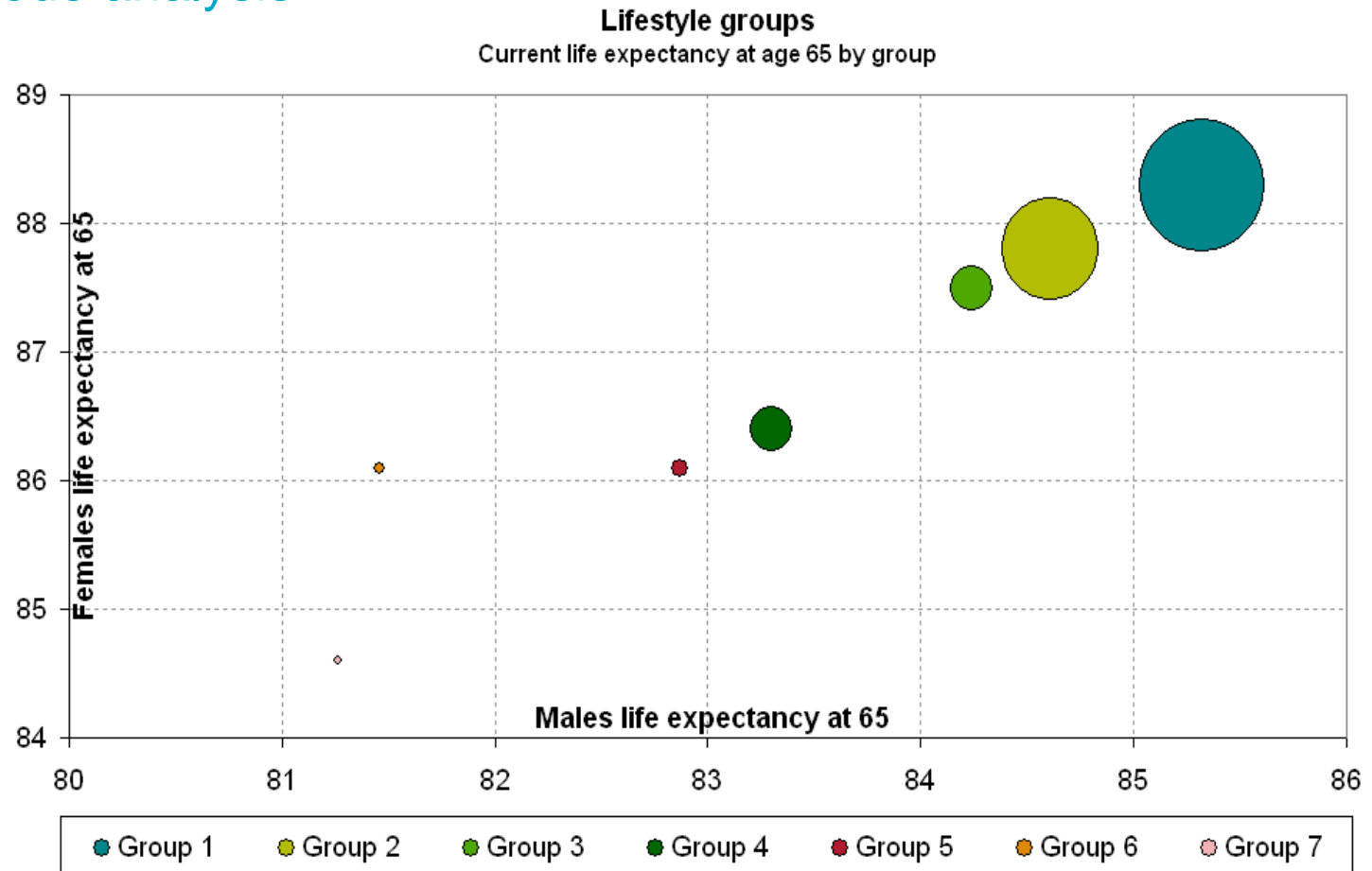
### Assumptions



# Valuations – Mortality

## Mortality – postcode analysis

### Assumptions



There are around **1.8 million** distinct postcodes in use in the United Kingdom, resulting in an average of around **15 houses** per postcode.

# Balancing Risk Asset and Liability Variability

## Assumptions







Many factors affect the risk profile of the Fund, but typically it is the financial market related factors which are dominant.

The relative size depends on the particular point in time and the maturity profile of the Fund.

# Sensitivity of liability value to assumption changes

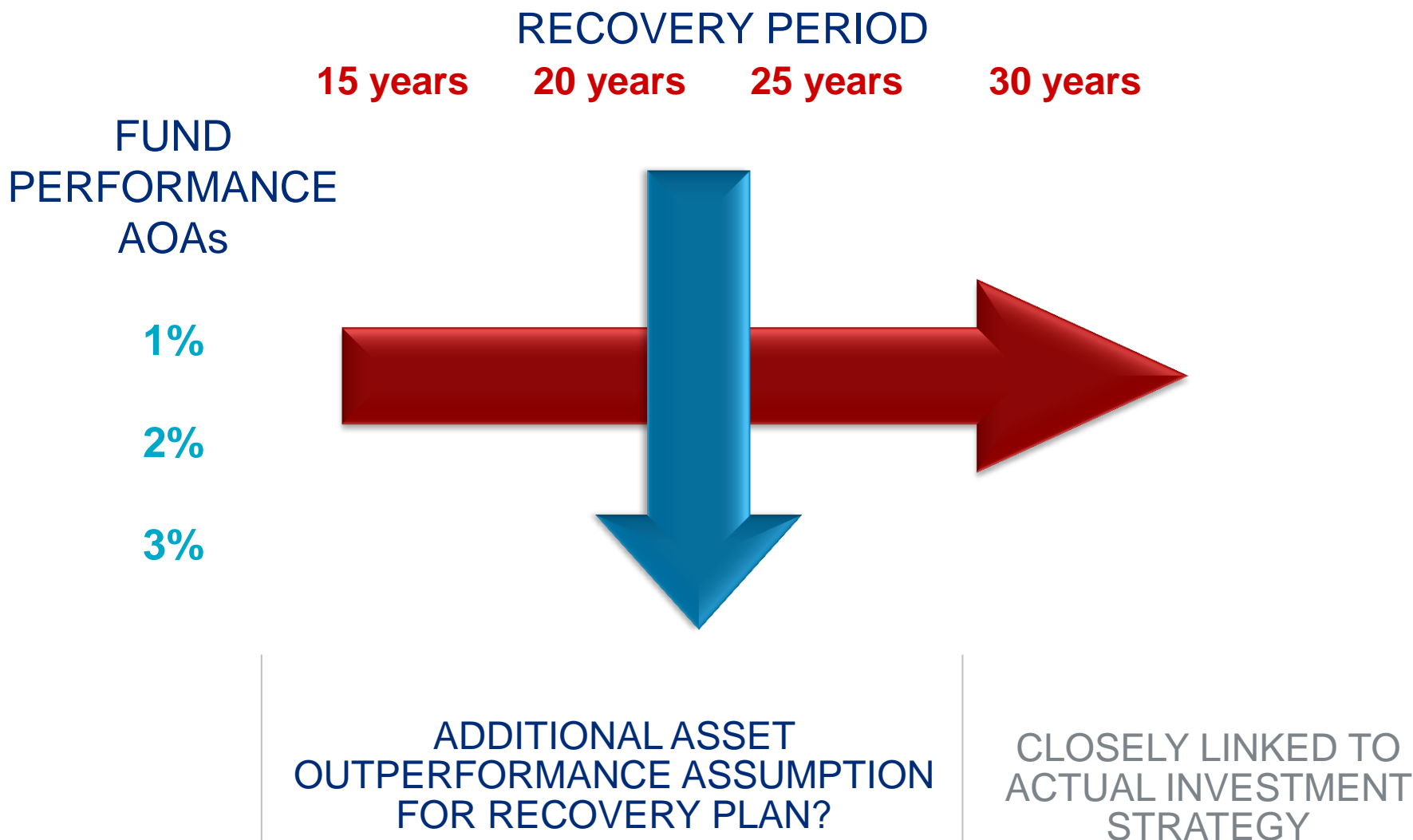
## Assumptions

1% p.a. increase in assumption	Approximate Impact on <b>total</b> Fund liability value
Discount rate / investment return	 20%
Salary Increases	 5%
Price Inflation (i.e. Pension Increases)	 20%
1 year increase in life expectancy	 3%

NET EFFECT IS KEY

# Interaction of factors Matrix

## Assumptions



FUNDING STRATEGY

# INDIVIDUAL EMPLOYERS





## SCHEDULED BODIES

District / County / Borough Councils  
Academies, Colleges  
Fire / Post 1992 Universities  
etc

## ADMITTED BODIES

Outsourcing contractors  
Charitable bodies  
Housing associations  
etc



EMPLOYERS HAVE  
DIFFERENT  
CHARACTERISTICS AND  
OBJECTIVES

# How do individual employers fit into the valuation process?

**Individual  
employers**

## LIABILITIES

- Each member valued and linked to their employer

## ASSETS

- Tracked notionally between valuations
- Allows for investment returns and cashflows

## CONTRIBUTIONS

- Future service contribution rate will reflect the profile of current active members
- Deficit contributions will reflect individual funding position and own circumstances

## Different objectives for different employers

**Individual  
employers**

**Expected  
period  
within Fund**

**Likelihood  
of recovery  
of closure  
deficit**

**Likelihood of  
premature  
withdrawal**

**Ability to  
guarantee  
payment of  
contributions**

**Strength  
of  
covenant**

**ALL COVERED IN THE FUNDING STRATEGY STATEMENT**

FUNDING STRATEGY

# FUNDING STRATEGY STATEMENT



### What is the Funding Strategy?

**Reg. 62(6)(b)** “The actuary must have regard ..... to the desirability of maintaining as nearly a *constant common rate* as possible”.

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**Reg. 62(6)(d)** “The actuary must have regard to the requirement to..... to *secure the solvency of the Fund* and the *long term cost efficiency*\* of the Scheme...”

\* New from 2016 valuation



### DCLG

“support regulatory requirement to maintain **constant** employer contribution rates”

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“encourage administering authorities to take a **prudent** longer-term view of their liabilities”

Clear and transparent strategy to meet employers' pension liabilities

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- Support stability in contribution rates *as far as possible*
- **Prudent** approach in funding the liabilities



### Purpose of the FSS

**All Fund employers should be consulted.**

**Process for consultation will be decided by the Administering Authority.**

**Consideration must be given to employers' views.**

**Ultimate responsibility rests with the Administering Authority.**



# Issues to be addressed in FSS

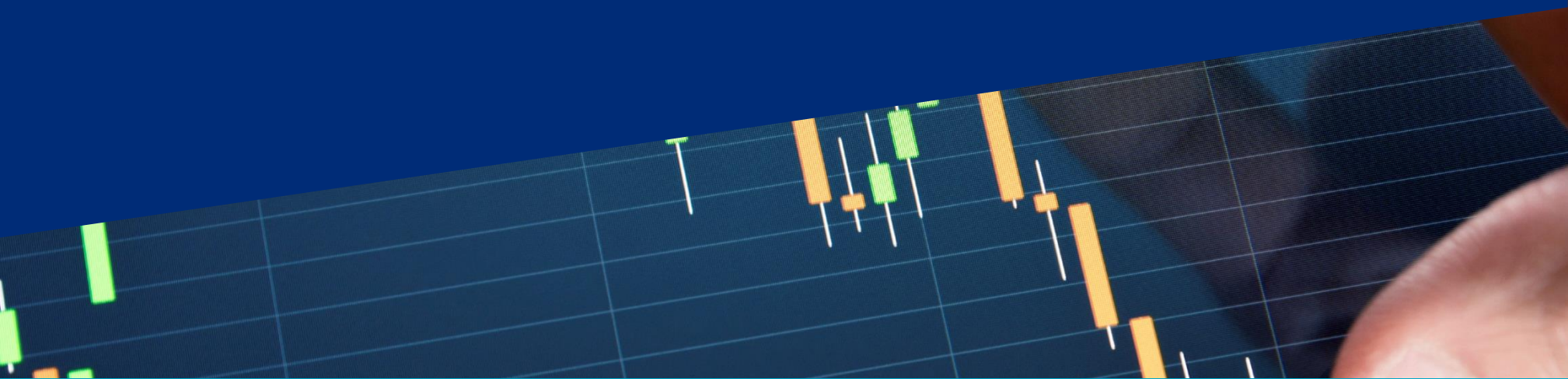
## Funding Strategy

- ✓ Time horizon for funding plan
- ✓ Link between funding strategy and investment
- ✓ Policies
- ✓ Risks to the funding strategy
- ✓ Monitoring and review of the strategy
- ✓ Financial standing of employers and impact on funding assumptions



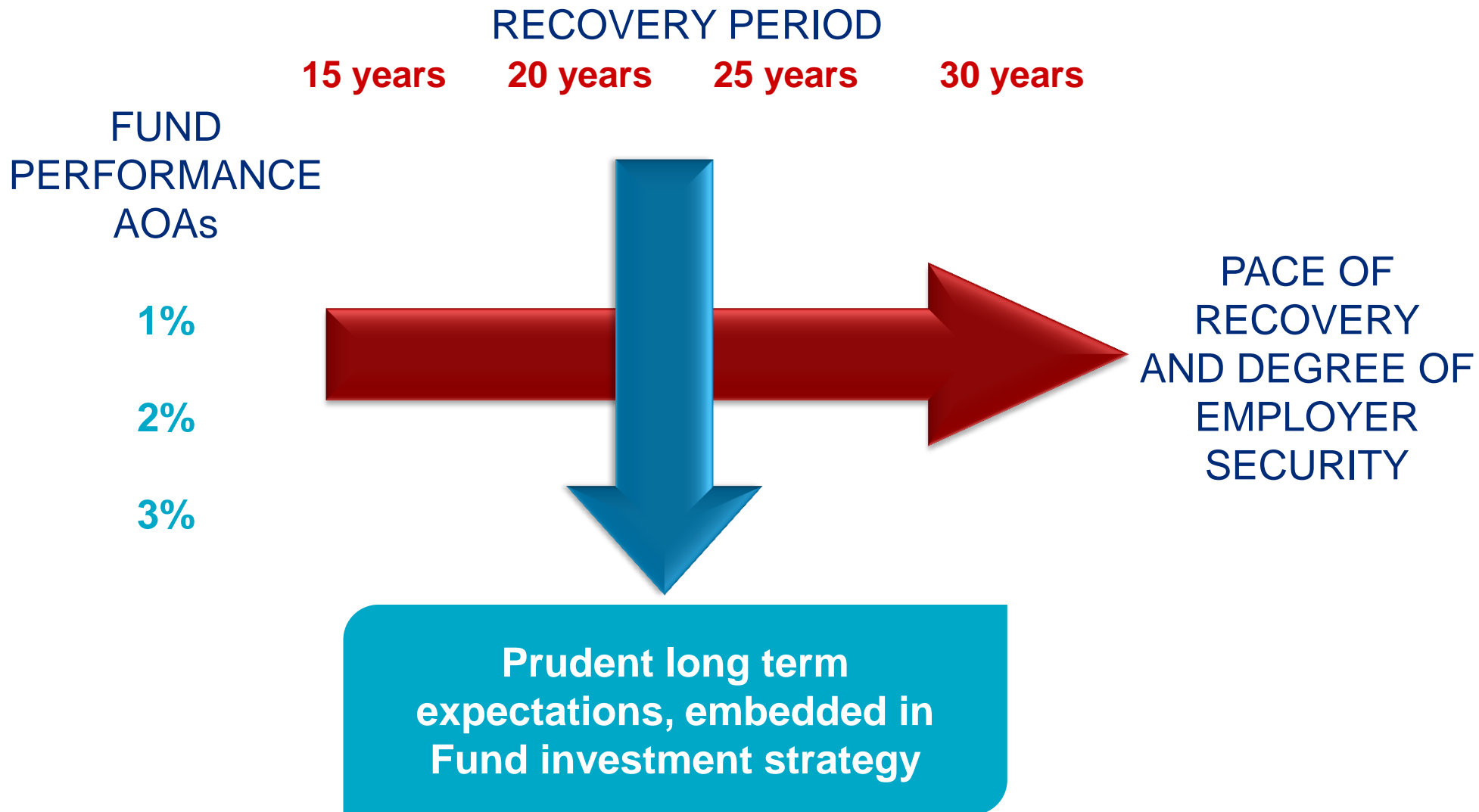
FUNDING STRATEGY

# DEFICIT RECOVERY



# Balancing Objectives Matrix

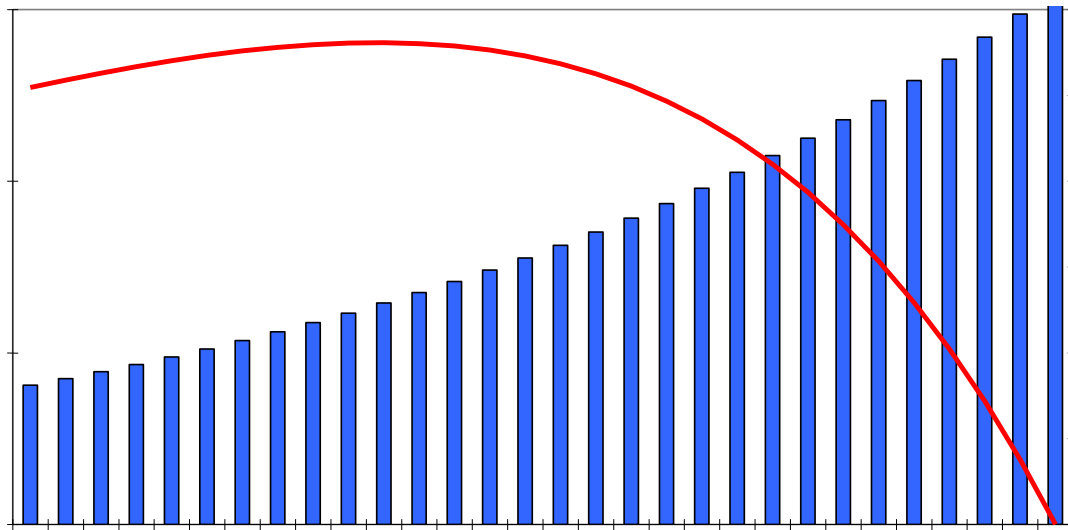
Deficit  
recovery



# Deficit Recovery

## Different repayment options

Deficit  
recovery



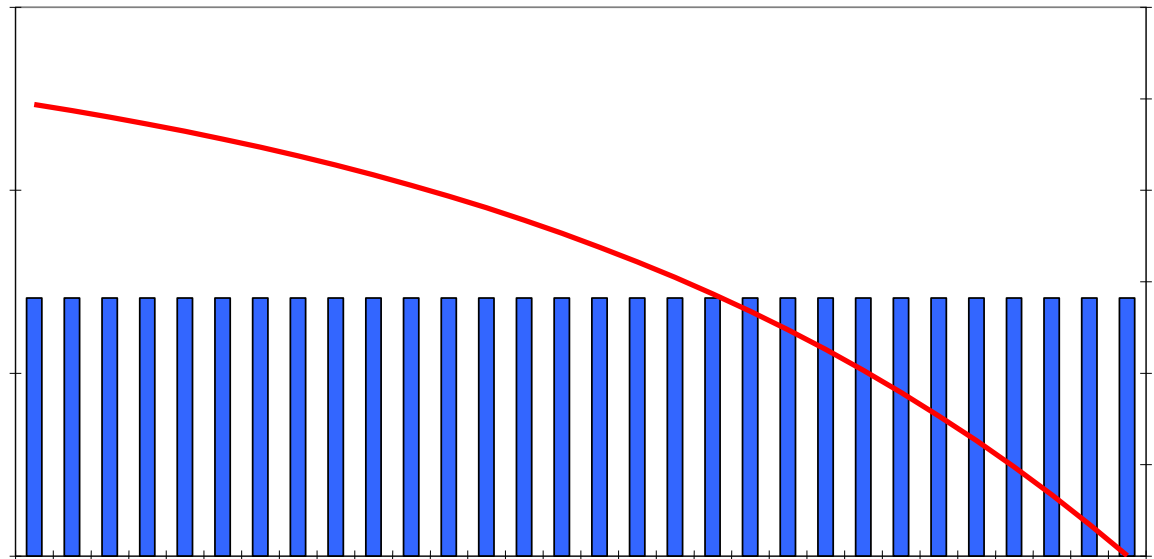
INCREASING PAYMENTS



MORTGAGE STYLE LEVEL  
PAYMENTS

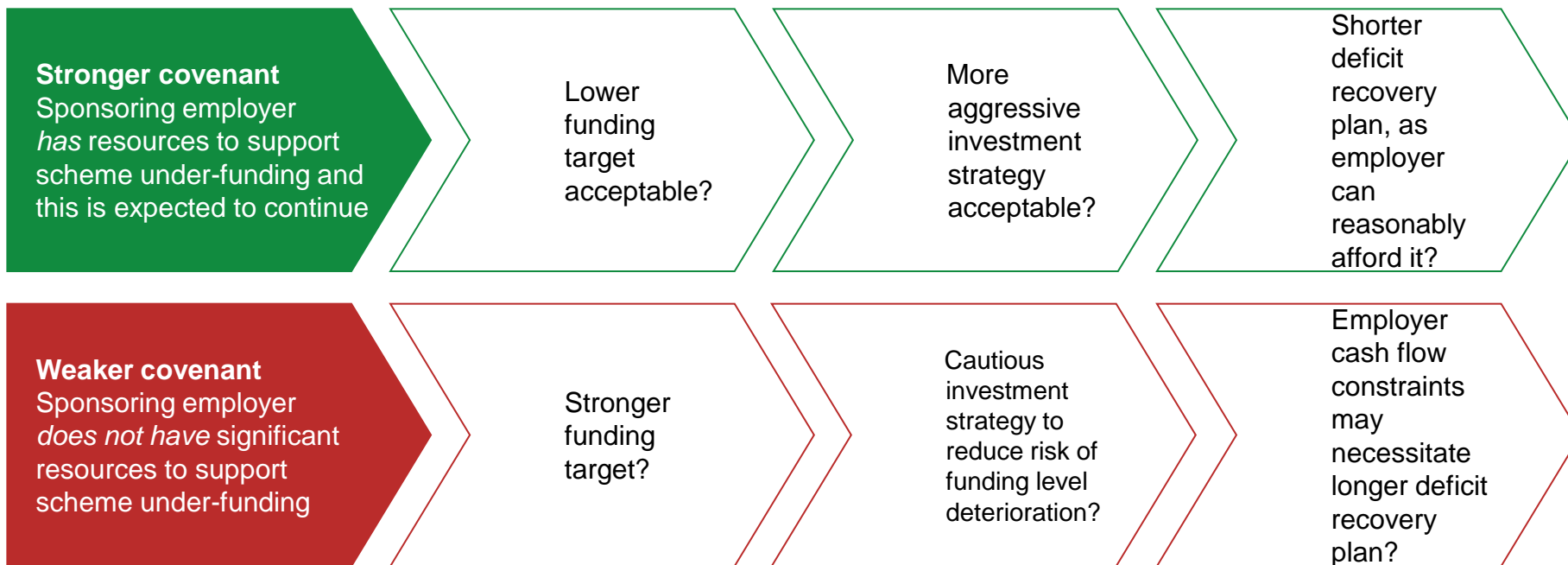


■ Deficit Funding Payment  
— Deficit



# Deficit recovery

## Employer covenant - Implications for funding and investment strategy



And finally...





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