Bedfordshire Pension Fund
2007 Valuation

David Cumming
November 2007
Agenda

- Purpose, Process and Methodology
- 2004 Summary
- What’s happened since?
- 2007 Whole Fund Results
What is the pension fund?

Future Cash Flows (Past Service)

Source: Hymans Robertson LLP, sample client
Summary of valuation process

valuation process

- data
- benefits
- funding strategy

- funding level
- contribution rates
# 2007 valuation data

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>% of total</th>
<th>Pensionable Pay / Pension £000</th>
<th>Average Pay / Pension £</th>
<th>Average Age Years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Employee members</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>3,928</td>
<td>10%</td>
<td>95,861</td>
<td>24,405</td>
<td>46</td>
</tr>
<tr>
<td>Women</td>
<td>12,525</td>
<td>32%</td>
<td>178,493</td>
<td>14,251</td>
<td>44</td>
</tr>
<tr>
<td><strong>Deferred Pensioners</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>3,474</td>
<td>9%</td>
<td>7,180</td>
<td>2,067</td>
<td>45</td>
</tr>
<tr>
<td>Women</td>
<td>9,448</td>
<td>24%</td>
<td>9,240</td>
<td>978</td>
<td>45</td>
</tr>
<tr>
<td><strong>Pensioners</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>3,752</td>
<td>9%</td>
<td>22,692</td>
<td>6,048</td>
<td>70</td>
</tr>
<tr>
<td>Women</td>
<td>6,409</td>
<td>16%</td>
<td>16,640</td>
<td>2,596</td>
<td>70</td>
</tr>
<tr>
<td><strong>Total membership</strong></td>
<td>39,536</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Funding strategy…

- **Affordability**: Contribution levels shouldn’t make the scheme unaffordable
- **Sustainability**: Contribution levels should be sustainable over time, provided problems aren’t being stored up
- **Stability**: Contributions shouldn’t vary materially from one valuation to the next
- **Prudence**: Strike the right balance of prudence in the risk/reward trade off

No single ‘correct’ approach, can change over time too
Methodology: Two stage calculation

“Past service position”
- compare market value of assets with market-linked value of accrued benefits (“liabilities”)
- funding level is assets / liabilities

“Future service rate”
- Employer share of cost of benefits accruing in the future, include expenses

As for 2004, “projected unit method”

calculate at whole fund level first
Where were we?

2004 past service position

Assets
£705m

Deficit
£255m

Liabilities
£960m

funding level : 73% whole fund
## 2004 contribution requirement

<table>
<thead>
<tr>
<th>Description</th>
<th>% of pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost of benefits</td>
<td>17.5%</td>
</tr>
<tr>
<td>Less: employee contributions</td>
<td>6.0%</td>
</tr>
<tr>
<td>Employer share of future service</td>
<td>11.5%</td>
</tr>
<tr>
<td>Plus: Adjustment for past service position</td>
<td>7.5%</td>
</tr>
<tr>
<td>Common Contribution Rate</td>
<td>19.0%</td>
</tr>
</tbody>
</table>

Contribution increases phased in over 3 years.
Market conditions

Equity Returns and Gilt Yields
Benefit changes

- Principal changes (affecting valuation):
  - Rule of 85
  - Commutation
  - New Scheme from April 2008
Post-retirement mortality experience

Actual v Expected Deaths (Amounts)

- Overall: reduction in funding level
2007 Proposals

Expectation of Life

- **c2007**: 18.7 yrs
- **c2017**: 19.6 yrs
- **c2033**: 20.7 yrs

Male aged 65 at retirement

Source: PMA92 table, no adjustment or guarantee period

Proposed 2007 assumptions

Observed pop’n improvements: 1 yr increase every 10
## 2007 Results

<table>
<thead>
<tr>
<th>Asset Out-performance Assumption (AOA) *</th>
<th>Whole Fund 2004 Results</th>
<th>Whole Fund 2007 Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset Out-performance Assumption (AOA)</strong> *</td>
<td>1.90%</td>
<td>1.90%</td>
</tr>
<tr>
<td><strong>Funding Level</strong></td>
<td>73%</td>
<td>80%</td>
</tr>
<tr>
<td><strong>Surplus/(Deficit) £m</strong></td>
<td>(255)</td>
<td>(274)</td>
</tr>
<tr>
<td><strong>Employer share of future service cost (% of pay)</strong></td>
<td>11.5%</td>
<td>12.5%</td>
</tr>
<tr>
<td><strong>Adjustment for past service position (20 years)</strong></td>
<td>7.5%</td>
<td>5.8%</td>
</tr>
<tr>
<td><strong>Common contribution rate (% of pay)</strong></td>
<td>19.0%</td>
<td>18.3%</td>
</tr>
</tbody>
</table>

* Overall asset out-performance assumption relative to gilt yields
Analysis of change in contribution rate

- Future service costs
  - Fall in real gilt yields
  - Mortality improvements
  - 2008 scheme

- Past service adjustment
  - Increase in monetary deficit
  - Higher payroll

overall decrease in common contribution rate
Analysis of change in contribution rate

- Contribution rate in 2004: -4.1%
- Roll forward to 2007: -1.6%
- Changes in demographic assumptions: 1.8%
- Allowance for commutation at 50%: 0.1%
- Change in life expectancy: -0.6%
- Change in asset outperformance: 1.7%
- Change in long term interest rates: 1.1%
- Change in anticipated inflation: 0.0%
- Abolition of the rule of 85: -1.6%
- New scheme 2008: 1.0%
- Contribution rate in 2007: 18.3%
- Contribution rate in 2004: 19.0%
Range of employer results

Contribution rates vary between employers due to:-

- Differences in membership profiles, maturity
- Different intervaluation experience e.g. mortality, salary growth, early retirements
- Different funding levels
Thank You

Any questions?
Appendix
Mortality

1 year increase in life expectancy every decade

Life Expectancy at age 65: England and Wales

Source: Government Actuary, English Life Table series of mortality tables
Mortality assumptions

- What is a “calendar year” projection?
  - c2017 means mortality rates allow for annual improvements built into the 92 series tables until 2017

- C2017 chosen for pensioners because average term of future pension payments is about 10 years for pensioners as at 31 March 2007

- C2033 chosen for non-pensioners because they are around 15/16 years from retirement

- This doesn’t include any allowance for accelerated improvements beyond those built into the 92 series tables
Gradually increasing maturity
## Pre-retirement experience

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Assumed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early leavers</td>
<td>6,017</td>
<td>6,145</td>
</tr>
<tr>
<td>Ill health retirements</td>
<td>84</td>
<td>277</td>
</tr>
<tr>
<td>Salary increases</td>
<td>5.7%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Pension increases</td>
<td>3.1%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Average age</td>
<td>50.5</td>
<td>50.0</td>
</tr>
</tbody>
</table>

- Overall: reduction in funding level
The effect of maturity: “Gearing”

Gearing Ratio

<table>
<thead>
<tr>
<th>Year</th>
<th>Accrued Liabilities</th>
<th>Payroll</th>
<th>Gearing Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>£800 m</td>
<td>£200 m</td>
<td>465%</td>
</tr>
<tr>
<td>2004</td>
<td>£1,200 m</td>
<td>£200 m</td>
<td>445%</td>
</tr>
<tr>
<td>2007</td>
<td>£1,600 m</td>
<td>£200 m</td>
<td>493%</td>
</tr>
</tbody>
</table>

Ratio of Accrued Liabilities to Payroll
# Financial conditions

<table>
<thead>
<tr>
<th></th>
<th>2004 % p.a.</th>
<th>2007 % p.a.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nominal</td>
<td>Real</td>
</tr>
<tr>
<td>Gilt yield</td>
<td>4.7%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Price inflation</td>
<td>2.9%</td>
<td>-</td>
</tr>
<tr>
<td>Salary increases</td>
<td>4.4%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Pension increases</td>
<td>2.9%</td>
<td>-</td>
</tr>
</tbody>
</table>

*lower real gilt yield – higher liability value*
Post-valuation events

Changes in market conditions since 31 March 2007

![Graph showing funding level and contribution rate % of pay over time from 31/03/2007 to 30/09/2007. The funding level remains above 70% throughout, while the contribution rate fluctuates between 5% and 23%.]
Key influences

Assets:
- Investment strategy
  - Fund assets fail to deliver discount rate / investment return assumption

Liabilities:
- Financial conditions
  - Gilt yields fall
  - Price inflation / pension increases rise
- Funding strategy
  - Inappropriate stabilisation mechanisms / contribution strategy
  - Insufficient allowance for life expectancy improvements
Sensitivity Analysis

Sensitivity to Market Conditions

- £274
- £485
- £372

Valuation Results

Surplus/(deficit)
Value of assets
Total liabilities

assumes effect occurs on valuation date

modelling can show how likely certain scenarios are
Sensitivity analysis: life expectancy

Sensitivity to Improvements in Life Expectancy

- No further improvement: £229
- Mortality rates fall by 25%: £362

Valuation Results:
- Surplus/(deficit)
- Value of assets
- Total Liabilities

£m

-500 0 500 1,000 1,500 2,000