Details of the Modelling work to Test the proposed MFR

August 2000

Prepared for

Pensions Board

Prepared by

Cliff Speed

Contents

MFR review modelling work

The review process

The MFR review working party was charged with developing a draft proposal for the revised MFR. The terms of reference were to come up with a proposal which

- is based on the outcomes of MFR working parties WP2 and WP3 – summaries of the reports of these working parties are set out in appendices B and C,
- takes account of the feedback from the MFR workshop held on 27 October 1999, and
- meets the objectives agreed by the DSS and the Institute and Faculty of Actuaries – these are set out in appendix A.

The modelling described in this document was carried out to quantify the effect of the proposed new MFR test. This work concentrated on analysing the funding levels and contributions under the current and proposed MFR.

Purpose of the modelling work

Modelling work was carried out to "stress" test and to "back" test the proposed MFR. The stress testing shows the impact of different economic scenarios that will materially affect the funding measures. The results from these scenarios should confirm our understanding of how the measures operate and quantify the degree to which a change in economic conditions affects the reported funding levels. The back testing shows how the different funding measures, and the solvency measure, would have operated in recent economic conditions.

Assumptions

The financial model developed to generate the results, like all financial models, makes certain assumptions and simplifications while aiming to capture the most significant features. It is important that the underlying assumptions are understood so that the results are not misinterpreted. Various underlying assumptions are set out below.

Liability Modelling

Modelling pension schemes

A variety of pension schemes were considered in the modelling. To capture the main features of the schemes representative members of the scheme were considered. These representative members are referred to as *model points*.

For each model point the following information was input by the user:

- number of members
- status of the member (active, deferred or pensioner)
- average amount of past service
- average current salary (for actives only)
- average accrued pension (for deferred members and pensioners)
- average age
- normal retirement date
- sex
- average proportion married
- mortality table to be used
- percentage of standard mortality that was applicable
- percentage of benefits in each benefit class

Different benefit classes provided different rates of accrual in deferment and different increases in pensions in payment. This allowed the model to provide for pre-88 and post-88 GMPs as well as RPI and LPI benefits on different classes of benefit.

Generic schemes considered

Using the inputs above three generic schemes were created. These three schemes were;

- *Average scheme*. Liabilities are distributed approximately 25% pensioners and 75% non-pensioners.
- *Immature scheme*. All the liabilities are non-pensioners.
- *Mature scheme*. 85% of the liabilities are pensioners, the remainder non-pensioners.

The stress testing and back testing was carried out for these three schemes to ensure that the proposed new test, MFR2, would provide an appropriate funding test for all types of scheme.

Development of the Scheme

In all cases a "stationary population" was assumed, ie where the maturity profile of the scheme remained stable over time. This enabled schemes with the same characteristics to be considered in different economic conditions.

Surplus spread periods

Results have been produced assuming two different sets of deficit correction periods. These are

- the MFR post transitional surplus spread periods, five years to reach 100% funding, and one year to reach 90% (referred to as [5/1] spread).
- three years to reach 90% funding and ten years to reach 100% funding (the [10/3] spread).

Contributions

The total contribution rate implied by the different measures considered, the current MFR, MFR2 and solvency, have been calculated. These contributions consist of the standard contribution rate under the Projected Unit Method (PUM) for future accrual of benefits and the contribution adjustment to take account of the surplus (deficit) in the scheme. The contribution adjustment is heavily dependent on the surplus spread period used.

Mortality assumption

The existing mortality assumption of PA(90) rated down two years for all members was used in the modelling. It was recognised that this assumption does not reflect recent improvements in mortality experience, however, the objective of the modelling was to test the economic consequences of the proposal and not the effects of mortality improvements. By keeping the mortality assumption the same a clear comparison between the different funding measures and the solvency measure could be made.

Investment issues

Investment strategy

The investment strategy assumed for the purposes of the modelling was

Asset class	Proportion
UK equities	55%
Overseas equities	15%
Index-linked gilts	5%
Fixed-interest gilts	15%
Corporate bonds	10%

This asset allocation is close to the current average UK pension scheme asset allocation. Furthermore, the split between bonds and equities is approximately that suggested by the current MFR for an "average" pension scheme.

This assumption had the effect of making the volatility of the current MFR funding level (and hence contribution rate) lower for the "average" scheme than it would be under the solvency and MFR2 measures.

Initial funding levels

The central set of results produced assumed that the initial current MFR funding level was 100%. Results were also produced for initial current MFR funding levels of 80% and 120%.

Current MFR change of basis

In June 1998 the current MFR was revised. The equity MVA was changed from being based on a gross dividend yield and a long term assumption of 4.25% to being based on the net dividend yield and using a long term assumption of 3.25%. This was taken into account in the model.

Solvency measure

The working party recognised that the prime objective was to "protect members' accrued rights". To test this objective a solvency measure which estimates the cost of securing the accrued benefits in the event of wind-up was needed. This led to the conclusion that the solvency measure should approximate the bases being used by insurance companies who were offering competitive quotations for annuities. Clearly the solvency standard would be a market based measure dependent on the yields available at the time the test was performed. While the insurance companies were reluctant to provide precise details of their pricing bases it was apparent that a number of companies take into account the spread between corporate bond yields and gilt yields.

For the purpose of the testing the default solvency measure was based on the buy-out cost of immediate and deferred annuities based on 75% of the gilt yield and 25% of the corporate bond yield.

It would be the responsibility of the scheme actuary to determine the solvency basis to be used in practice, including whether and how the default basis might need to be strengthened to take account of a particular features of a scheme. It needs to be recognised that any solvency measure is a snapshot and the actual position at the date of the report could be significantly different. This issue would need to be carefully communicated by the Scheme Actuary. This also suggests that spurious accuracy and precision should be avoided in this measure, and again this would need to be carefully communicated.

Reasonable expectations

The terms of reference state that the protection should "enable pensions in payment to continue in full", and hence the solvency standard must be applied to this class of member. For non-pensioners the terms of reference require "a reasonable expectation of receiving benefits" at the same level as if the scheme had remained ongoing. Therefore the lower level of security provided to non-pensioners should be reflected in the funding measure.

The working party proposed a *funding measure* for MFR2 which is related to the *default solvency measure* by a simple relation depending only on the period to MFR age:

$$(minimum\ \ funding\ \ measure) = \frac{(default\ \ solvency\ \ measure)}{(1+r)^{(N-x)}}$$

where

N is MFR pension age

x is member age

r is the allowance for reasonable expectations

For the purposes of testing the value of r was set at 1%.

Stress Testing and Back Testing

Purpose

The purpose of the back testing and stress testing is to demonstrate how the current and proposed tests have operated in recent economic conditions and how they would operate in a set of pre-defined economic conditions.

Stress Testing

In the stress testing economic scenarios were identified that would materially affect the funding measures. The results from these scenarios should confirm our understanding of how the measures operate and quantify the degree to which a change in economic conditions affect the reported funding levels.

Scenario	Description
1	Neutral Current levels of yields and inflation persist, equities return 2.0% pa in excess of gilts.
2	Rising inflation Inflation increases by 2.5% pa in each of the following three years, gilt yields also rise.
3	Falling inflation, then deflation Inflation falls by 2.0% pa each year leading to deflation of 3.7% pa in year 3.
4	Equity market crash Equity markets fall 35% in year 1, and the dividend yield rises by 1% in the year of crash.
5	Falling credit spreads The yield in excess of gilts from holding corporate bonds falls to 0.3% pa over the three years.
6	Falling nominal yields and credit spreads Falling interest rates are accompanied by falling credit spreads.
7	Rising nominal yields and credit spreads The converse of scenario 6.

8

Falling dividend yield

The dividend yield falls, equity prices rise, but not sufficiently to account for the fall in dividend yield. This scenario reflects recent events where the composition of equity indices has been affected by companies with low (or zero) dividends.

A full list of the assumptions are given in Appendix D The results of the stress testing are shown in Appendix E.

Back Testing

Back testing provides information on how the funding measures would have operated in recent economic conditions. Clearly, the performance of the measures is determined by the financial conditions during the test period. The most significant feature of financial markets in recent years for a pension fund (especially one investing a large proportion of their assets in equities) has been the "bull" equity market. The relative values of the funding measures rather than their absolute values are of primary interest.

It is important to recognise that:

- "back testing" is a negative test – passing a test based on the last *n* years does *not* prove that the replacement for the MFR will pass the same test for the next *n* years,
- allowing companies to fund pension schemes at a lower level does not necessarily save cost – but it *will* reduce the security of members' benefits, and
- any test which amounts to testing whether equities out-perform matching assets will inevitably show a positive result if applied using recent data because this period has been favourable for equities – tests of smoothing are often versions of this.

The back testing considered the solvency, current MFR and MFR2 funding positions and the contributions required in the actual economic conditions experienced in the UK over the following periods;

- annually since March 1983
- quarterly since March 1994
- monthly since March 1998.

Comparisons between the funding levels reported by the current MFR and MFR2 over these periods are shown in Appendix F.

Appendix A DSS terms of reference

Underlying objectives

- Benchmark funding level for salary related occupational pension schemes to protect members' accrued rights in the event of the sponsoring employer becoming insolvent.
- Protection at a level to enable pensions in payment to continue in full (excluding future discretionary increases) and give non-pensioners a reasonable expectation of receiving benefits at a level that would have been paid if they had become deferred members and the scheme continued as an ongoing scheme.
- "Reasonable expectation" means an "even chance" on transfer to an appropriate alternative pensions vehicle.
- The benchmark funding level should be derived from an objective test which is independent of the circumstances of each scheme (except for gilt-matched schemes).
- In most circumstances, meeting MFR should not require, in the long term, contributions which exceed the contributions produced by ongoing valuations for a scheme which is fully funded on the ongoing basis on reasonably prudent actuarial assumptions.

Analysis of existing valuation method against those objectives

- Consider the extent to which adjustments might be made to the existing valuation method (within the existing framework of primary legislation) so that it is better adapted to the objectives (e.g. whether it should also include assumptions about investment in overseas equities and property, and whether it takes proper account of capital growth).

Consider fundamental changes in approach which could achieve the underlying objectives and advise the DSS on these alternatives.

Other factors to take into account

- Variations in the valuation basis for schemes of different size/maturity and for insured schemes.
- The effect of taking greater account of market values and capital growth compared with the greater reliance on long-term rates of return (taking into account proposals from the Accounting Standards Board in relation to a more market based approach to accounting standards).
- The desirability (or otherwise) of smoothing out volatility in outcomes and the means of achieving this.
- Possible changes to the supporting structure of the MFR (e.g. the schedule of contributions and time limits for under-funded schemes).
- Links between the MFR and minimum cash equivalent transfer values, deficiency calculation on wind-up/employer insolvency, solvency test for contracting-out, calculation of compensation.

Consideration of a central discontinuance fund / employer or scheme insurance / compensation with a levy.

Appendix B Summary of WP2 - matching asset solvency test

Terms of reference

"To develop a basis for a solvency test using published market returns for appropriate matching assets and then to consider how this could be adopted as a minimum funding test and operated in practice".

Conclusions

The working party distinguished between a *solvency standard* and a *funding standard*. Both are required but they are different things:

- The solvency standard should be a meaningful measure of scheme solvency (unlike the current MFR) to be disclosed to members so that it is clear whether assets are sufficient to secure the liabilities.
- The funding standard defines the controls which are placed on schemes which determine to what extent they meet the solvency standard.

The solvency standard should be determined as follows:

(a) Benefits to be taken into account should be leaving service benefits excluding discretionary benefits (i.e. consistent with existing legislation).

(b) Where there is a traded matching asset, this should be used to determine the cost, e.g. long-dated bond yields should be used to determine the relevant discount rates.

(c) Where no traded market exists (e.g. demographic and expense elements), then either a minimum standard should be specified or the scheme actuary should justify departing from a suggested standard.

(d) Scheme assets should be measured at realisable value (subject to due credit being given for insurance policies which guaranteed member security).

It is important to note that the *funding standard* does not necessarily have to ensure that the *solvency standard* is automatically met in full - the minimum target level of solvency is a matter for Government to determine. What is critical is that the *solvency standard* on which the *funding standard* is based is a meaningful one because this will lead to clear and transparent information on solvency and cost both for members and for employers.

We point out that, as recognised in the recent exposure draft for accounting for company pension costs (which is receiving increasing support from within the actuarial profession), the cost to UK companies of their defined benefit pension obligations is largely independent of either how the assets are invested or how the actuary chooses to value the assets and liabilities in order to set contribution rates. The only way in which these decisions can reduce the cost of these liabilities to UK companies is if together they increase the risk that pension benefits will not be paid if the sponsoring employer ceases to exist. However, this is precisely the scenario which a minimum funding standard is aiming to address.

Further investigative work needed now

The various mechanisms proposed for the funding standard should be tested for effectiveness at meeting the solvency standard, robustness and impact on company finances. Consideration should also be given to how they should be phased in.

Because of the potential impact of a revised MFR on the liquidity of very long-dated gilts, the particular issue of whether (and how) to use corporate bond yields instead of or in conjunction with gilt yields to determine the solvency standard should be addressed.

Appendix C Summary of WP3 - market-based MFR test

Terms of reference

"To develop an MFR basis which starts from a "matching asset" solvency test and modifies it to incorporate an allowance for additional expected equity returns.

Conclusions

- The economic cost of benefits should be based on yields on the matching assets
- But if this was the basis of MFR, it would lead to an unacceptable burden on schemes
- The purpose of an equity premium is therefore to balance security and cost
- Estimates of level of the premium vary widely
- The level should be chosen to give an acceptable balance between security and cost, as much as to be theoretically accurate

We suggest 2% pa (net of expenses)
Smoothing

- Smoothing would enable schemes to follow equity-based investment strategies without unacceptable MFR risk
- The actuary should explain to trustees the implications of the smoothing
- We suggest a mechanism which smoothes movements in equity markets relative to gilts over the previous 12 months
- The purpose is to even out short-term fluctuations but not mask long-term effects
- We suggest that the smoothing formula should use a notional portfolio of 70% UK equities, 10% European equities, 10% North American equities and 10% Far Eastern equities
- We also suggest an alternative approach whereby the liabilities are not smoothed but deficit correction periods are longer

Schedule of Contributions

- We would welcome proposals to base contributions on the MFR position at the valuation date (not at the certification date)
- This would lead to a two year correction period if MFR<90%
- We suggest removing the annual recertification (except possibly for schemes where MFR<100%)

Other issues

- Cash equivalents should follow MFR except no smoothing
- Similarly for debt on employer and priorities on winding up
- We suggest the debt regulations should be changed to prevent manipulation by trustees
- Where gilt matching applies, the formula should be identical except that there should be no smoothing

Work to be done

Back-testing (and future scenario-testing) is required to fine-tune and to test the robustness of our proposals.

Appendix D Assumptions for the stress testing

1- Neutral scenario

	Initial	Projected yields		
Inflation	2.3%	2.3%	2.3%	2.3%
Salaries	5.5%	5.5%	5.5%	5.5%
corporate (AAA) yield	6.2%	6.2%	6.2%	6.2%
corporate BBB+ yield	6.5%	6.5%	6.5%	6.5%
IL yield	1.9%	1.9%	1.9%	1.9%
Net dividend yield	2.1%	2.1%	2.1%	2.1%
Implied forward inflation	3.2%	3.2%	3.2%	3.2%
		Projected total returns		
UK Equity		7.1%	7.1%	7.1%
Overseas equity		7.1%	7.1%	7.1%
ILG		4.2%	4.2%	4.2%
Gilts		5.1%	5.1%	5.1%
All BBB+ corporate bond		6.5%	6.5%	6.5%

2 - Rising Inflation

	Initial	Projected yields		
Inflation	2.3%	4.8%	7.3%	9.8%
Salaries	5.5%	8.0%	10.5%	13.0%
Gilt yield	5.1%	5.6%	6.1%	6.6%
corporate BBB+ yield	6.5%	7.0%	7.5%	8.0%
IL yield	1.9%	1.9%	1.9%	1.9%
Net dividend yield	2.1%	2.1%	2.1%	2.1%
Implied forward inflation	3.2%	3.7%	4.2%	4.6%
		Projected total returns		
UK Equity		2.1%	2.1%	2.1%
Overseas equity		2.1%	2.1%	2.1%
ILG		6.9%	9.4%	11.9%
Gilts		0.1%	0.8%	1.4%
All BBB+ corporate bond		1.9%	2.5%	3.2%

3. Deflation

	Initial	Projected yields		
Inflation	2.3%	0.3%	-1.7%	-3.7%
Salaries	5.5%	4.0%	2.5%	1.5%
Gilt yield	5.1%	4.1%	3.1%	2.1%
corporate BBB+ yield	6.5%	5.5%	4.5%	3.5%
IL yield	1.9%	1.9%	1.9%	1.9%
Net dividend yield	2.1%	2.1%	2.1%	2.1%
Implied forward inflation	3.2%	2.2%	1.2%	0.2%
		Projected total returns		
UK Equity		2.1%	2.1%	2.1%
Overseas equity		2.1%	2.1%	2.1%
ILG		2.4%	0.4%	-1.6%
Gilts		16.1%	16.0%	15.9%
All BBB+ corporate bond		16.5%	16.2%	16.0%

4. Equity Market crash

	Initial	Projected yields		
Inflation	2.3%	2.3%	2.3%	2.3%
Salaries	5.5%	5.5%	5.5%	5.5%
Gilt yield	5.1%	5.1%	5.1%	5.1%
corporate BBB+ yield	6.5%	6.5%	6.5%	6.5%
IL yield	1.9%	1.9%	1.9%	1.9%
Net dividend yield	2.1%	3.1%	3.1%	3.1%
Implied forward inflation	3.2%	3.2%	3.2%	3.2%
		Projected total returns		
UK Equity		-32.9%	3.1%	3.1%
Overseas equity		-32.9%	3.1%	3.1%
ILG		-7.4%	5.4%	5.4%
Gilts		5.1%	5.1%	5.1%
All BBB+ corporate bond		6.5%	6.5%	6.5%

5 - Falling credit spreads

	Initial	Projected yields		
Inflation	2.3%	2.3%	2.3%	2.3%
Salaries	5.5%	5.5%	5.5%	5.5%
Gilt yield	5.1%	5.1%	5.1%	5.1%
corporate BBB+ yield	6.5%	6.0%	5.5%	5.3%
IL yield	1.9%	1.9%	1.9%	1.9%
Net dividend yield	2.1%	2.1%	2.1%	2.1%
Implied forward inflation	3.2%	3.2%	3.2%	3.2%
		Projected total returns		
UK Equity		2.1%	2.1%	2.1%
Overseas equity		2.1%	2.1%	2.1%
ILG		4.4%	4.4%	4.4%
Gilts		5.1%	5.1%	5.1%
All BBB+ corporate bond		11.3%	11.0%	7.5%

6 - Falling nominal yields and credit spreads

	Initial	Projected yields		
Inflation	2.3%	1.8%	1.3%	0.8%
Salaries	5.5%	5.5%	5.5%	5.5%
Gilt yield	5.1%	4.1%	3.1%	2.1%
corporate BBB+ yield	6.5%	5.2%	3.9%	2.6%
IL yield	1.9%	1.9%	1.9%	1.9%
Net dividend yield	2.1%	2.1%	2.1%	2.1%
Implied forward inflation	3.2%	2.2%	1.2%	0.2%
		Projected total returns		
UK Equity		2.1%	2.1%	2.1%
Overseas equity		2.1%	2.1%	2.1%
ILG		3.9%	3.4%	2.9%
Gilts		16.1%	16.0%	15.9%
All BBB+ corporate bond		19.8%	19.8%	19.9%

7 - Rising nominal yields and credit spreads

	Initial	Projected yields		
Inflation	2.3%	2.3%	2.3%	2.3%
Salaries	5.5%	5.5%	5.5%	5.5%
Gilt yield	5.1%	6.1%	7.1%	8.1%
corporate BBB+ yield	6.5%	7.8%	9.1%	10.4%
IL yield	1.9%	1.9%	1.9%	1.9%
Net dividend yield	2.1%	2.1%	2.1%	2.1%
Implied forward inflation	3.2%	4.2%	5.1%	6.1%
		Projected total returns		
UK Equity		2.1%	2.1%	2.1%
Overseas equity		2.1%	2.1%	2.1%
ILG		4.4%	4.4%	4.4%
Gilts		-4.5%	-3.0%	-1.4%
All BBB+ corporate bond		-4.8%	-2.7%	-0.6%

8 - Falling dividend yield

	Initial	Projected yields		
Inflation	2.3%	2.3%	2.3%	2.3%
Salaries	5.5%	5.5%	5.5%	5.5%
Gilt yield	5.1%	5.1%	5.1%	5.1%
corporate BBB+ yield	6.5%	6.5%	6.5%	6.5%
IL yield	1.9%	1.9%	1.9%	1.9%
Net dividend yield	2.1%	1.6%	1.1%	0.6%
Implied forward inflation	3.2%	3.2%	3.2%	3.2%
		Projected total returns		
UK Equity		27.1%	26.5%	25.9%
Overseas equity		27.1%	26.5%	25.9%
ILG		4.4%	4.4%	4.4%
Gilts		5.1%	5.1%	5.1%
All BBB+ corporate bond		6.5%	6.5%	6.5%

Appendix E Results of Economic Stress Testing

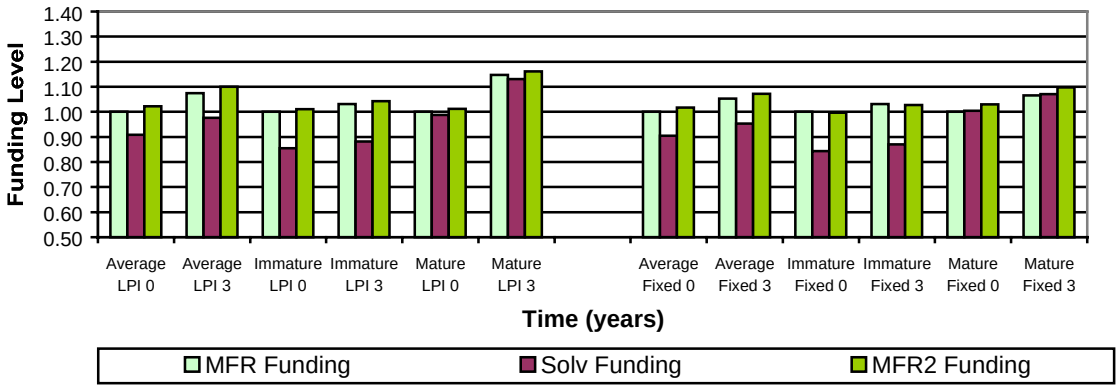
In this Appendix, we examine a range of possible future economic scenarios. We measure the effect on three types of schemes; Average, Immature and Mature, of three funding tests:

- the current MFR test – "MFR funding"
- the default security, as an approximation to buy out costs – "solvency funding"
- the proposed new MFR test – "MFR2 funding"

The results are shown separately for schemes with LPI pension increases and schemes with fixed percentage increases.

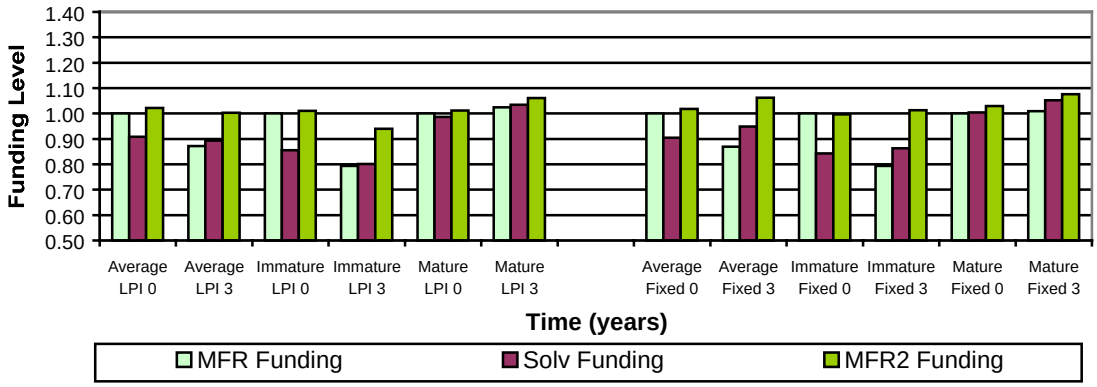
In each case we look at the change over a three year period, representing the period from one valuation to the next. The starting point is always that the scheme is initially 100% funded on the current MFR test. The method allows for internally consistent projected investment returns on a typical portfolio of assets (70% UK and overseas equities, 30% gilts and corporate bonds) for each scenario.

Scenario 1 : Neutral Scenario



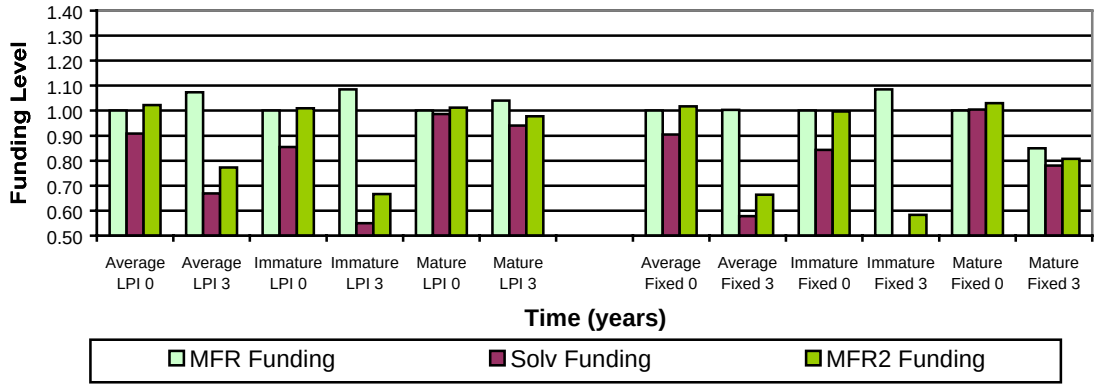
The neutral scenario considers the continuation of current conditions. The lack of volatility in investment markets results in no major changes in any of the three funding measures. On the left hand set of charts the change over 3 years for 3 pension schemes with LPI increases is shown. At the far left the average LPI scheme shows an improvement in the funding position under all 3 measures at the end of the 3 year period. This is a result of investment returns exceeding those required to cover the additional benefits accruing in the period. A similar situation is shown for the immature scheme. The mature scheme has the most significant improvement in funding level. This is because the current level of inflation is assumed to continue and the scheme has 70% equity investment. The charts for the schemes with fixed pension increases (of 3% pa) result in slightly lower funding levels because of the rate of inflation used for the LPI increases is less than 3%.

Scenario 2 : Rising Inflation



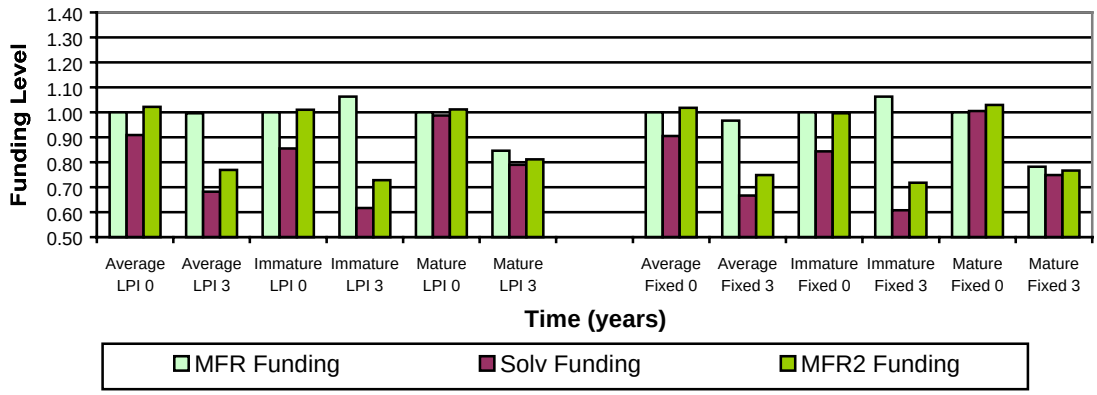
Rising inflation is accompanied by rising yields in this scenario. This in effect "weakens" the MFR2 and solvency bases, leading to a lesser impact on the reported funding level for these measures, while the current MFR level falls for the average and immature schemes.

Scenario 3 : Deflation



Deflation is the converse of scenario 2. Here lower yields on gilts and corporate bonds result in a "strengthening" of the solvency and MFR2 measures with the resultant decrease in funding levels under these measures. The fixed pension increases result in higher liabilities and hence lower funding levels.

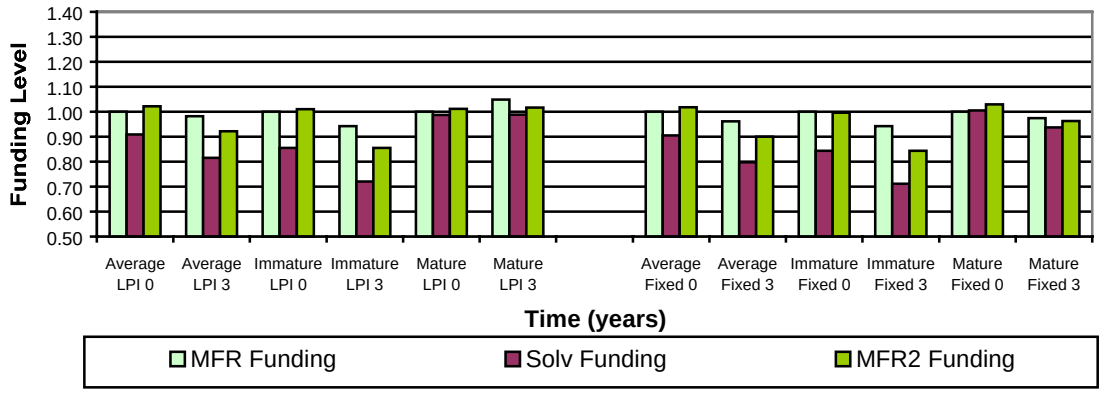
Scenario 4 : Equity Market Crash



In this scenario equity markets fall by 35% in year 1 and then remain level for the following 2 years. The large exposure to equities affects the value of the assets, however for the existing MFR the assumed rise

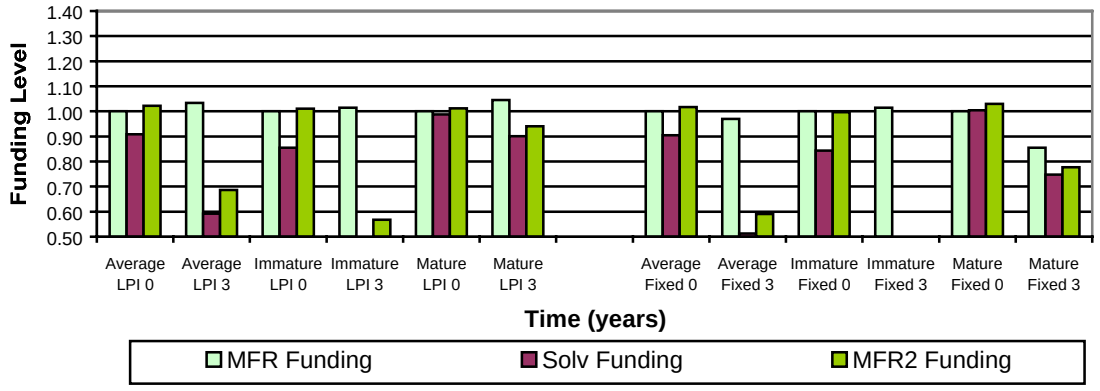
in the dividend yield offsets the effects of the fall. Note that this may not be the case if prices and dividends do not move in this manner (see scenario 8).

Scenario 5 : Falling Credit Spreads



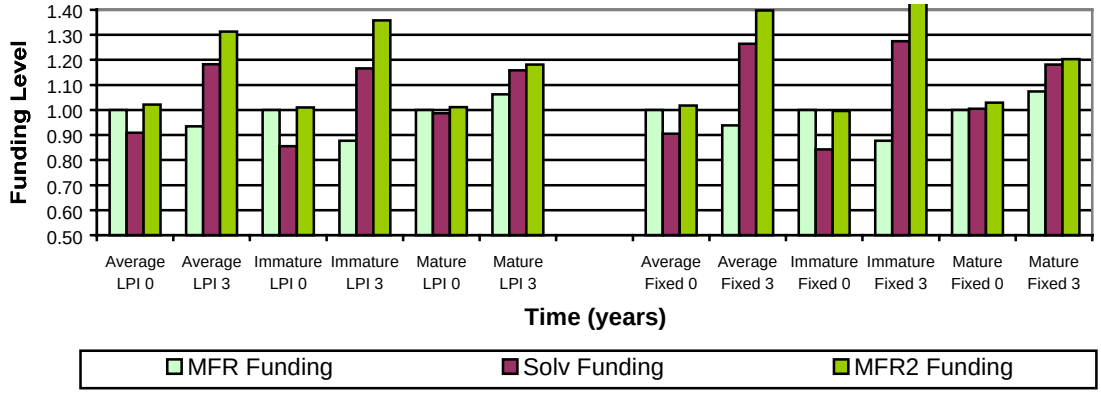
In this scenario credit spreads decline to 0.3% over the 3 years. This "strengthens" the basis for the solvency and MFR2 measures.

Scenario 6 : Falling Nominal Yields and Credit Spreads



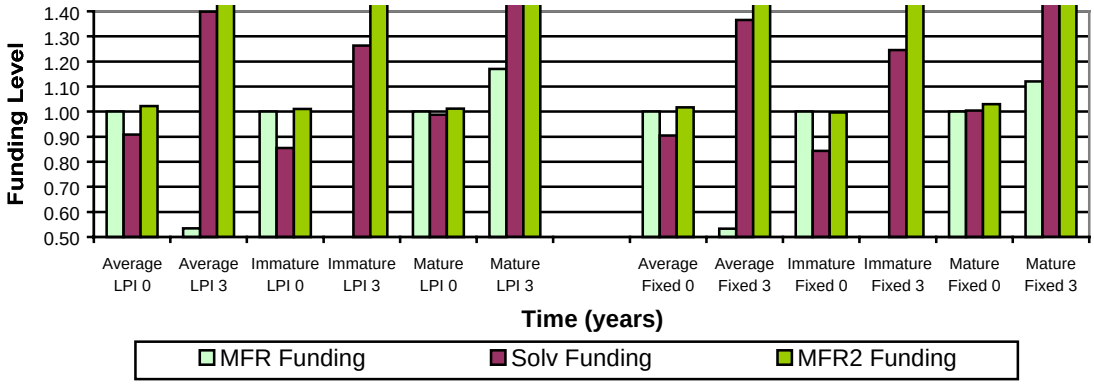
In this scenario credit spreads fall at the same time that yields fall. At the end of the 3 year period gilt yields are assumed to be 2%. The dramatic "strengthening" of the solvency and MFR2 bases is clearly visible, while the current MFR is largely unaffected due to the MVAs.

Scenario 7 : Rising Nominal Yields and Credit Spreads



This scenario shows the converse of scenario 6. The increasing yields improve the terms on which liabilities can be "bought out".

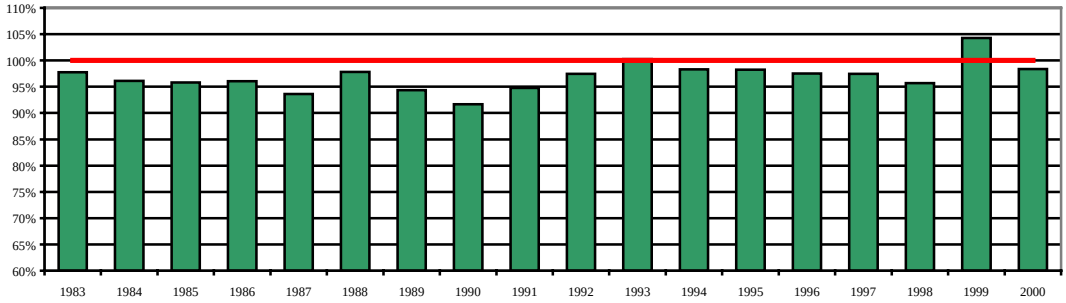
Scenario 8 : Falling Dividend Yield



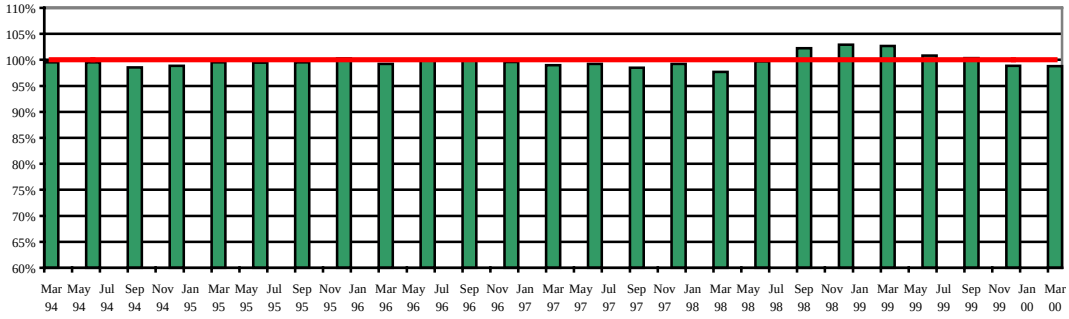
This scenario represents the situation where the dividend yield falls and equity prices rise. However, the rise in equity prices is not sufficient under the current MFR for the funding level to be maintained. As can be seen from the graph above, for the average and immature schemes the MFR funding level falls below 60% after 3 years. The solvency and MFR2 tests do not use dividend yield in valuing liabilities. The strong equity growth results in higher funding levels under these measures.

Appendix F Comparison between the Current MFR and Proposed New MFR

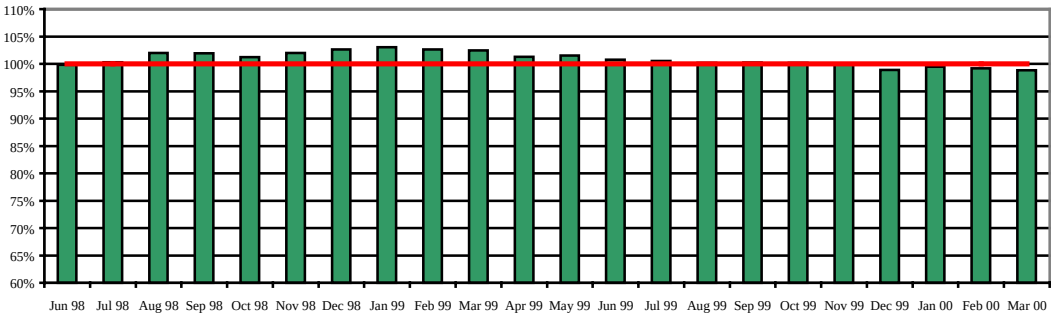
Mature Schemes With LPI Increases : 1983 - 2000



Mature Schemes With LPI Increases : March 1994 - March 2000



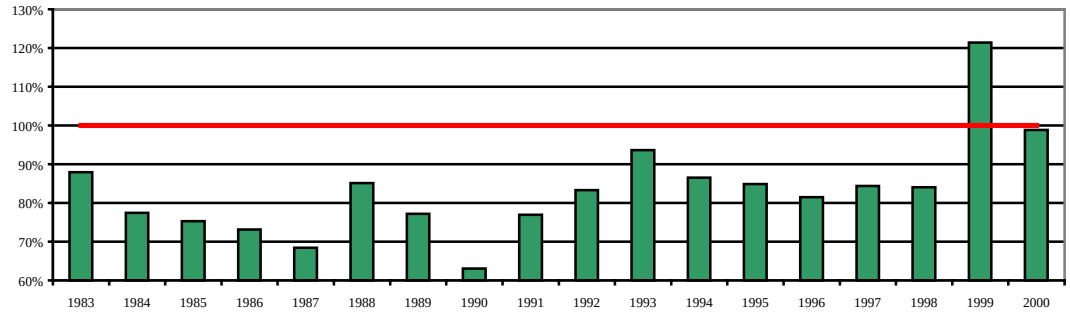
Mature Schemes With LPI Increases : June 1998 - March 2000



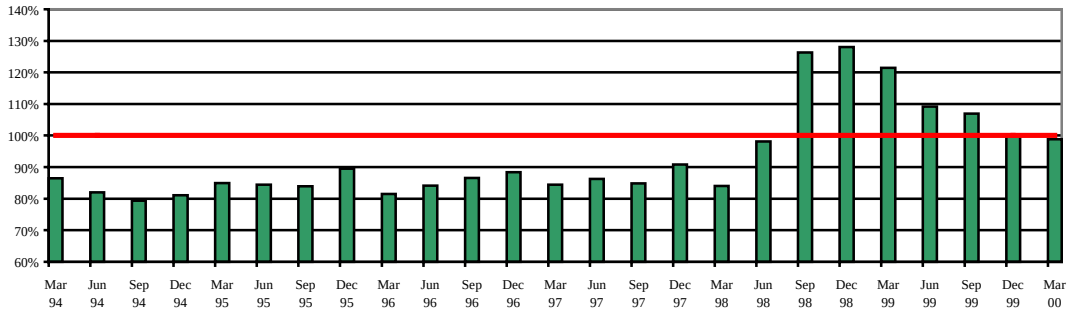
The bars show the funding level on the current MFR that is equivalent to 100% funding on the proposed new MFR.

Appendix FComparison between the Current MFR and Proposed New MFR

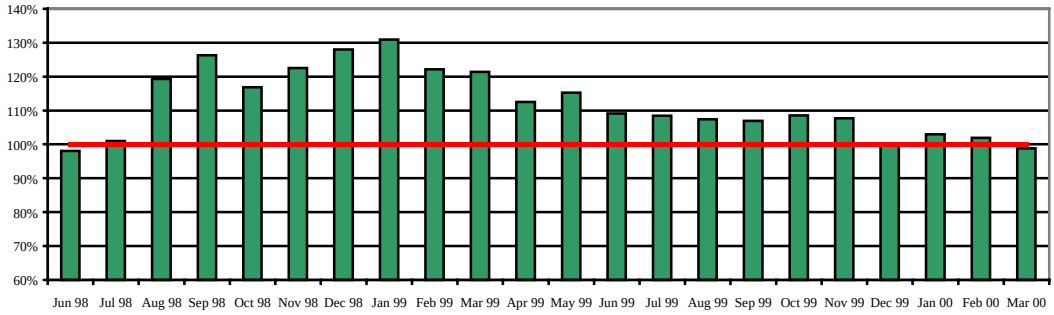
Immature Schemes With LPI Increases : 1983 - 2000



Immature Schemes With LPI Increases : March 1994 - March 2000



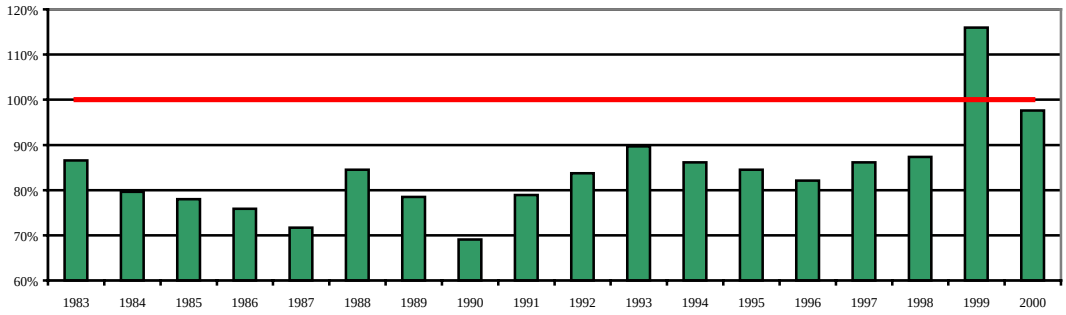
Immature Schemes With LPI Increases : June 1998 - March 2000



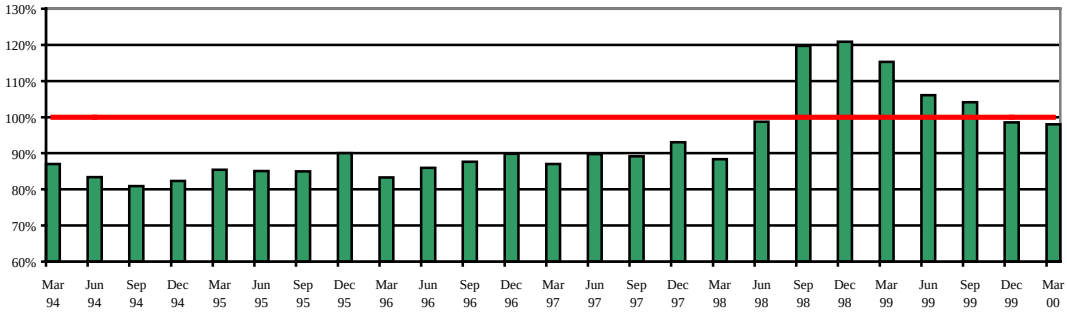
The bars show the funding level on the current MFR that is equivalent to 100% funding on the proposed new MFR.

Appendix FComparison between the Current MFR and Proposed New MFR

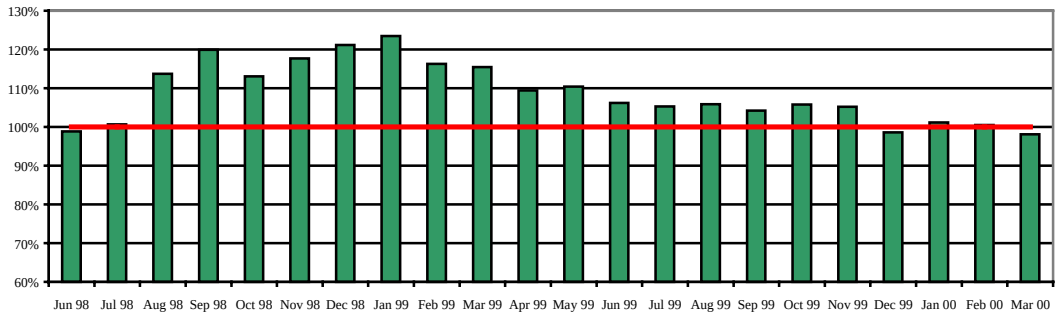
Average Schemes With Fixed Increases : 1983 - 2000



Average Schemes With Fixed Increases : March 1994 - March 2000



Average Schemes With Fixed Increases : June 1998 - March 2000



The bars show the funding level on the current MFR that is equivalent to 100% funding on the proposed new MFR.

26 September 2000