Subject SP4

CMP Upgrade 2021/22

CMP Upgrade

This CMP Upgrade lists the changes to the Syllabus objectives, Core Reading and the ActEd material since last year that might realistically affect your chance of success in the exam. It is produced so that you can manually amend your 2021 CMP to make it suitable for study for the 2022 exams. It includes replacement pages and additional pages where appropriate.

Alternatively, you can buy a full set of up-to-date Course Notes / CMP at a significantly reduced price if you have previously bought the full-price Course Notes / CMP in this subject. Please see our 2022 *Student Brochure* for more details.

This CMP Upgrade contains:

- all significant changes to the Syllabus objectives and Core Reading
- additional changes to the ActEd Course Notes and Assignments that will make them suitable for study for the 2022 exams.

0 Changes to the Syllabus

There are no ***non-trivial*** changes to the syllabus objectives.

1 Changes to the Core Reading and ActEd text

This section contains all the changes to the Core Reading and ActEd Text needed to make the 2021 Course Notes suitable for study for the 2022 exams.

Note that in the 2022 Course Notes, Chapter 10 is now included in Part 2 of the Course Notes and hence is covered in Day 1 of the tutorials. (In 2021, Chapter 10 was included in Part 3 of the Course Notes and Day 2 of the tutorials.) This change also affects the split of the questions in the assignments.

Chapter 4

Page 7/8

The following items have been added to the list of possible disclosure requirements that straddles pages 7 and 8:

- the value of the liabilities
- **duration of the liabilities**
- **sensitivity of the value of the liabilities to changes in assumptions**
- **duration of the investments**

Chapter 9

Page 3

Three paragraphs of Core Reading about Covid-19, Brexit and climate change have been added to the end of Section 1. Replacement pages are attached.

Chapter 13

Page 18

The list of factors typically considered in ESG given in the Core Reading has been expanded. Specifically, the following has been added to the list of environmental factors:

- **desertification**

The following have been added to the list of social factors:

- **migration**
- **social unrest**

Chapter 18

Section 4.3 describes different ways of setting the discount rate. In this section, the bond yields plus risk premium approach is no longer considered to be a replicating portfolio approach by the Core Reading. ActEd text has been modified to reflect this. Replacement pages are attached.

The summary at the end of Chapter 18 has been adjusted to reflect this; it now simply lists the three methods of setting the discount rate.

Practice Questions

The Practice Questions at the end of each chapter have been reviewed. In the light of the move to online, open-book exams, the following questions are no longer considered to be exam-style:

- Part 1: 3.2, 5.4, 5.5,
- Part 2: 6.1, 6.3, 6.5, 6.6, 6.11, 7.5, 8.1, 8.3, 10.4
- Part 3: 11.1, 11.2, 12.1, 13.1, 13.2, 13.4,
- Part 4: 15.2, 15.4, 16.1, 16.2, 16.4, 16.5, 16.7,
- Part 5: 17.1, 18.1, 18.2, 18.3, 18.7, 18.10, 18.11, 19.1,
- Part 6: 20.1, 21.1, 21.2, 22.3, 22.4, 22.7

2 Changes to the X Assignments

The X Assignments, in particular Assignments X1-X4, have changed significantly, in particular to reflect the online nature of the exams and the movement of Chapter 10 from Part 3 to Part 2 of the Course Notes. We have not detailed all of the changes in this upgrade. If you would like the new assignments *without* marking, then retakers can purchase an updated CMP or standalone X Assignments at a significantly reduced price. Further information on retaker discounts can be found at:

www.acted.co.uk/paper_reduced_prices.html

If you wish to submit your scripts for marking but have only an old version of the assignments, then you can order the current version free of charge if you have purchased the same assignments in the same subject in a previous year, and have purchased marking for the 2022 session. We only accept the current version of assignments for marking, *ie* those published for the sessions leading to the 2022 exams.

Assignment X6

Solution 6.3

The solution to Question 6.3 has been amended so that it makes reference to non-insurance consolidators:

In part (i), 'transfer to a non-insurance consolidator' should be added to the list of options for the provision of outstanding benefit payments, and the 'Total 3' at the end of the solution changed to 'Maximum 3'. So the solution now reads:

1. continue as a closed scheme
2. transfer the liabilities to another pension scheme of the same employer
3. transfer directly to the beneficiary
4. transfer to a personal pension or new employer's scheme to invest
5. transfer the liabilities to an insurer to guarantee the benefits by purchasing deferred or immediate annuities
6. transfer to a non-insurance consolidator
7. transfer to a central discontinuance fund.

[½ mark for each option, maximum 3]

In part (ii), 'Option 6 – transfer to a central discontinuance fund' should be renumbered to be Option 7 and 'Option 5 – transfer to an insurer …' should now read:

Options 5 and 6 – transfer to an insurer or a non-insurance consolidator

The assumptions are influenced significantly by the terms offered by the insurer / consolidator … [½]

… and are likely to be more prudent than those used for the ongoing funding valuation … [½]

… as the terms will contain profit, expense and contingency margins … [½]

… and also allow for reinvestment and longevity risk. [½]

The cost of transferring the benefits to a consolidator may be lower than the cost of purchasing annuities with an insurer … [½]

… and this may be reflected in the assumptions used for a discontinuance valuation. [½]

Solution 6.5

In the solution to Question 6.5, the final sentence (about adjustment to a standard table) has been deleted.

3 Other tuition services

In addition to the CMP you might find the following services helpful with your study.

3.1 Study material

We also offer the following study material in Subject SP4:

- Flashcards
- Revision Notes
- ASET (ActEd Solutions with Exam Technique) and Mini-ASET
- Mock Exam and AMP (Additional Mock Pack).

For further details on ActEd's study materials, please refer to the 2022 *Student Brochure*, which is available from the ActEd website at **www.ActEd.co.uk**.

3.2 Tutorials

We offer the following (face-to-face and/or online) tutorials in Subject SP4:

- a set of Regular Tutorials (lasting a total of three days)
- a Block (or Split Block) Tutorial (lasting three full days)

For further details on ActEd's tutorials, please refer to our latest *Tuition Bulletin*, which is available from the ActEd website at **www.ActEd.co.uk**.

3.3 Marking

You can have your attempts at any of our assignments or mock exams marked by ActEd. When marking your scripts, we aim to provide specific advice to improve your chances of success in the exam and to return your scripts as quickly as possible.

For further details on ActEd's marking services, please refer to the 2022 *Student Brochure*, which is available from the ActEd website at **www.ActEd.co.uk**.

3.4 Feedback on the study material

ActEd is always pleased to receive feedback from students about any aspect of our study programmes. Please let us know if you have any specific comments (*eg* about certain sections of the notes or particular questions) or general suggestions about how we can improve the study material. We will incorporate as many of your suggestions as we can when we update the course material each year.

If you have any comments on this course, please send them by email to **SP4@bpp.com**.

1 Risks and uncertainties

If there is a delay between a benefit being promised and that benefit being provided, there will always be some uncertainty for the sponsor, the recipient, or both. This uncertainty may relate to the level or incidence of:

- **the benefits**
- **the contributions required to pay for those benefits**.

Attached to the uncertainty is a risk for the potential beneficiary that:

- **the benefits will be less valuable than expected**
- **they will not be received at the expected (or required) time.**

There is also a risk for the sponsor that:

- **costs will be greater than expected**
- **payments will be required at an inopportune time.**

In circumstances where there is no uncertainty about the level or incidence of the benefits or contributions, there may still be risks, to some of the parties involved, that these certain amounts have been adversely affected by inflation.

Inflation erodes the value of a fixed benefit between the date it was promised and the date it is paid.

There is also a risk for the government that it is expected to put right any losses that the public incurs.

Question

State the key benefits of discussing risks of running a pension scheme with all interested parties.

Solution

It will focus all the parties, with their differing objectives, on the management of the risks involved in running a pension scheme. It forces the discussion, measurement and monitoring of risk which is necessary if they are going to control the risks. This will lead to a common understanding of the scheme's objectives which in itself will help reduce the risks.

In this chapter we shall discuss the risks of DB and DC provision. In designing a scheme, the sponsor's attitude to risk has a significant influence on the choice between DB and DC provision. In the case of DB schemes, the sponsor primarily takes on the experience risks. In the case of DC schemes, the member primarily takes these risks.

Non-investment risks for a DB scheme include such events as:

- members retiring early with generous benefits, *eg* ill-health retirements
- pensioners living longer than expected
- the default of the sponsor (which would be a risk to the members).

At the time of writing (Winter 2021) the enduring effect of the Covid-19 pandemic on both the global economy and financial markets, and hence the impact on pension schemes, will not be known for some time. This version of the Core Reading does not attempt to address these areas.

The United Kingdom left the European Union on 1 January 2021 without an EU-wide arrangement for the operation and regulation of financial services. Discussions will continue during 2021 and this version of the Core Reading does not attempt to address these areas.

An emerging risk likely to impact pension provision is climate change risk. This can be defined as the risks arising from adverse changes in the physical environment and secondary impacts in the economy at a regional or a global scale. The impact of climate risk is discussed further in Chapter 13. In addition to investment strategy, climate risk is likely to have an impact on the sponsor covenant and on the scheme's experience in terms of, for example, mortality and morbidity rates.

2 Benefits

2.1 Benefits known in advance (defined benefit)

Risk of inadequate funds

Where the benefits are pre-defined, perhaps the greatest risk for a potential beneficiary is that there are insufficient funds available to provide the promised benefit. This may be as a result of:

- **insufficient funds having been set aside, *ie* underfunding, or**
- **it may be as a result of the insolvency of a sponsor of the benefits, *eg* an employer, or**
- **it may be a combination of both of these events.**

For employer-sponsored benefit schemes the existence of the employer is the most important factor in having benefits met in full.

A funded scheme could be underfunded because:

- the assumptions about future experience were unduly optimistic, *ie* the contributions were unrealistically low
- the assumptions were reasonable but the experience turned out to be unfavourable – we are dealing here with stochastic processes and the outcome is, by definition, uncertain
- the sponsor did not pay what was required, *eg* due to poor commercial performance or even insolvency
- the benefits were larger than originally intended, *eg* due to benefit improvements perhaps forced by legislation or benefit options that were not cost-neutral.

For an unfunded scheme the risk is that the resources are not available when needed to meet the benefit once it comes into payment, *eg* due to poor commercial performance.

Question

Explain how an unfunded scheme could reduce the risk of being unable to pay benefits.

Solution

One approach could be to take out credit insurance against the risk of the employer insolvency. This provides security assuming benefits are suitably covered by insurance and the risk of insurer default is negligible.

Alternatively employers may band together to offer their own protection scheme for employees in relation to accrued benefits. This is a form of compensation fund.

Replicating portfolio, mark to market, or market consistent approach

Using a 'replicating portfolio' involves taking the fair (*ie* market) value of the liabilities as the market value of the portfolio of assets which most closely replicates the duration and risk characteristics of the liabilities.

The replicating portfolio can be established by using stochastic optimisation techniques, *ie* a form of asset liability modelling.

For the liabilities there is an implicit assumption that a set of bonds can be found that could be used to replicate each type of benefit (*ie* pensions with fixed increases, pensions with inflation linked increases, deferred pensions, *etc*).

From each set of bonds it is possible to derive a yield curve.

The yield curves can be applied to the corresponding projected benefits of each type to place a value on the benefits that is consistent with the value of the replicating portfolio.

Note that it is not always necessary to identify the replicating portfolio, only to hypothecate that the replicating portfolio could be constructed from the bonds used to derive the yield curve.

For many pension schemes, the appropriate yield curves are those relating to nominal government bonds and inflation-linked government bonds if they exist. In other cases, curves derived from the swap market are used.

In practice many actuaries still use an 'average' yield as the discount rate and project any inflation-linked benefit payments forward using a market implied inflation rate, which is calculated as the difference between the yield on nominal bonds and the real yield on inflation-linked bonds.

However, this approach is just an approximation to using yield curves.

For benefits that involve caps and floors on the rates of increase (for example many pensions increase each year in line with price inflation up to a cap and will not decrease if inflation turns to deflation), the process is somewhat more complicated, but the underlying principle remains the same.

As discussed in the financial economics course, a replicating portfolio involving optionality will typically be dynamic, *ie* the composition of the portfolio will change over time depending on economic circumstances. The value of the liabilities is, therefore, the value of the portfolio that would be held at the time of the valuation.

For a benefit that has capped and floored pension increases, the relevant replicating portfolio will depend on the shape of yield curves at the time, but will typically involve a combination of inflation-linked and nominal bonds.

For example, if market implied inflation rates were:

- **high (above the cap in the benefit increases), then the replicating portfolio is likely to involve more nominal bonds than inflation linked bonds**
- **somewhere between the floor and the cap, the replicating portfolio may be predominantly inflation-linked bonds.**

All the assumptions used in the valuation must be market related.

Inflation

The inflation assumption may be derived as the difference between the yields on suitable portfolios of fixed-interest and index-linked bonds.

Where index-linked bonds are not available the rate of inflation will need to be estimated from alternative sources of information, such as government forecasts.

The yield available on fixed-interest bonds and historical information on inflation versus fixed-interest bond yields may also give some indication of the expected rate of inflation.

This method is objective and uses information readily available in the market.

Government bonds or corporate bonds

One must decide whether to use the yield on government bonds or corporate bonds.

The yield on corporate bonds is normally higher than that of government bonds representing the higher default risk and higher marketability / liquidity risk of corporate bonds.

A pension scheme with positive net cashflow (*ie* higher contribution and investment income than benefit payments required) can cope with marketability / liquidity risk so it may be acceptable to include the risk premium for this in the discount rate.

However, we can assume that the pensioner liabilities have very little or no default risk; in other words we must pay them. The default risk of an asset would therefore pose a problem for a pension scheme.

So we could use a discount rate based on the expected returns on either government bonds (*ie* the GRY) or on corporate bonds for which we have stripped out the default risk element.

Bond yields plus risk premium

For the liabilities, the discount rates are based on bond yields as with the mark to market approach but then increased to take account of the additional returns expected on other asset classes.

This method fits somewhere between the mark to market approach and the asset-based approach or it could simply be viewed as an alternative way of expressing the asset-based approach, in that the order of magnitude of the margin over bond yields assumed will typically be related to the expected returns on the scheme's actual investments (as well as taking into account other issues such as the degree of prudence that is desirable as discussed above).

The magnitude of the increase in discount rates is often referred to as an 'equity risk premium', but this is misleading and it is more accurate to refer to it as an excess return assumption reflecting the expected returns on the actual investments of the scheme (which are likely to include much else besides equities).

The excess return assumption may be constant over time or may vary depending on the actuary's assessment of market conditions, or as for the asset-based described above, the extent to which the (best-matching) **investment strategy is expected to change over time.**

It is more common to use a variable risk premium, which is derived by a combination of market information and actuarial judgement.

Some actuaries argue that it is unsound to allow for the higher expected returns that may be available on assets such as equities without allowing for the extra risk, and that if the additional returns offered are wholly offset by risk then the liabilities should only be valued using a risk-free rate of return (*ie* bond yields).

5 Member options and guarantees

Important exam tip

In Subject ST4, options and guarantees was the most frequently tested topic in the course – with many questions and long questions about options.

Questions often required detailed knowledge and understanding of:

- *the different options*
- *high-level factors to think about when setting option terms*
- *how to determine assumptions and calculate the option factors.*

However, in Subject SP4 there is significantly less Core Reading on options and guarantees, as much of the Core Reading on the topic from Subject ST4 has been removed. At this point, the extent to which options and guarantees will be tested in Subject SP4 is still unclear. Our opinion is that it is risky for you not to have some knowledge and understanding of the above three areas. The first two areas were covered in a scheme design chapter, and the final one is covered in the next section of this chapter. As a result, this section contains very little Core Reading and is mainly ActEd text.

The value of a member's benefits could differ materially depending on whether a member leaves service, dies in service or retires, at or after normal retirement age, or early in good health or on incapacity grounds.

In some schemes members have options as to the form in which they may take their benefits, and guaranteed terms may apply (which may not be actuarially neutral).

Typically these may include the age at which a member may retire, an option to take some or all of their pension as a lump sum, and possibly to surrender a part of their pension for additional pension to their spouse.

5.1 Valuation principles for calculating option factors

Some of the following themes were discussed in the scheme design chapter on options and guarantees. Here, they are discussed from a technical standpoint in terms of how to do the detailed calculations to determine the option factors.

Neutrality / fairness

As a starting point, the valuation funding basis may be used to calculate option terms such that the alternative benefits have equivalent value to the reserve held in the scheme.

The alternative benefits can be determined by setting up an equation of value. The value of the benefits before and after the option is taken up is set to be equal on a given set of assumptions.