

Subject SA3

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.

We only accept the current version of assignments for marking, *ie* those published for the sessions leading to the 2022 exams. If you wish to submit your script for marking but have only an old version, then you can order the current assignments 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.

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

This section contains all the *non-trivial* changes to the syllabus objectives.

Syllabus item 2.6 has been deleted and the subsequent syllabus items renumbered.

Syllabus item 3 has been renamed 'Reserving, capital modelling and reinsurance'.

Syllabus item 3.3 has been added:

- 3.3 Demonstrate higher order understanding of the commercial and regulatory environments and their effect on reserving and capital. (Chapter 4)

1 Changes to the Core Reading and ActEd text

This section contains all the *non-trivial* changes to the Core Reading and ActEd text.

Chapter 4

Page 8

A small section has been added before the section on further reading:

Regulatory response to climate change

Regulators can sometimes impose requirements when there is a need for a strategic approach across all insurers. An example of this is climate change, where given the uncertainty related to climate change, there is increased concern from regulators across the world regarding its impact on financial risks.

For example, in the UK, the Prudential Regulatory Authority (PRA) now requires insurers to:

- **embed the consideration of the financial risks from climate change in their governance arrangements**
- **incorporate the financial risks from climate change into existing financial risk management practice**
- **conduct (long term) scenario analysis to inform strategy setting and risk assessment and identification**
- **develop an approach to disclosure on the financial risks from climate change.**

In May 2017, the IFoA issued a risk alert on climate-related risk which requires actuaries to carefully consider and take account of climate-related risks in any relevant decisions, calculations or advice.

Climate change will be discussed further in Chapter 11, Latent and disease claims.

Chapter 7

Page 28

The first two paragraphs have been replaced with the following paragraph:

To allow for shorter-term climate oscillations in catastrophe models, eg in windstorm models, model vendors produce alternative sets of event frequencies, which reflect their near-term estimates of frequency based on the current climate. To allow for future changes in the climate, the frequencies of certain events may need to be adjusted. Research is ongoing into the impacts of climate change on catastrophic weather, and so multiple sensitivity tests may be needed to reflect the uncertainty around this.

Also, a new bullet point has been added to the end of the list in the second paragraph of Section 5.3:

- **changes in the severity of hazards due to climate change.**

Chapter 11

Page 20

Section 8 has been rewritten. Replace pages 19 – 20 with pages 19 – 20a which are provided at the end of this Upgrade.

Chapter 17

A number of changes have been made to this chapter to reflect changes that have been made to the reading list provided on the IFoA website. Many items have been deleted from the website, and one has been added, namely 'A practitioner's introduction to stochastic reserving: the one-year view'.

Glossary

The following definitions have been amended:

Accumulation of risk

An accumulation of risk occurs when a single event can give rise to claims under several different policies (for example in property insurance), or to claims from many risks covered under the same policy (for example in employers' liability).

Cape Cod method

The Cape Cod method uses the historical experience of some or all origin years as implied by the chain ladder method, adjusted for rate changes and claims inflation. More weight is given to years which the incurred chain ladder method suggests are more developed and where the exposure (usually measured by premium written) is higher.

Stop loss reinsurance

An excess of loss reinsurance that provides protection based on the total claims, from all perils, arising in a class or classes over a period. The excess point and the upper limit are often expressed as a percentage of the cedant's premium income rather than in monetary terms; for example, cover might be for a loss ratio in excess of 110% up to a limit of 140%.

2 Changes to the X Assignments

There have been no significant changes to the X Assignments.

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 SA3:

- Flashcards
- 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 SA3:

- 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 SA3@bpp.com.

7 Cyber risk

Cyber attacks are, at the time of writing, deemed to be one of the world's top technological risks, and the topic has already been examined in Subject SA3.

As technology improves, and a host of devices become increasingly interconnected, the risks associated with errors in, or the malicious use of, technology become greater.

Cyber insurance is a relatively new product that has been developing over the last 10 years or so. Initially pricing and reserving has been relatively crude for this risk, however there have been some high-profile incidents of data breaches in recent times that are now being used to estimate the frequency and severity of claims.

There have been a number of high-profile cyber events in recent years, and this is both a significant risk and a significant opportunity for the industry. Nobody in the UK will have missed the 'WannaCry' ransomware worldwide attack in 2017, affecting the National Health Service IT systems, striking at the very centre of a vital public service. Even events such as the British Airways computer crash in 2017, whilst not related to a cyber attack, heightened the awareness of the world's reliance on technology.

Insurance of cyber risk is a huge growth area, mainly due to a rapid growth in awareness of such risks and fear of future breaches. In the period 2015–2017, business volumes doubled in the UK, yet there is still a reluctance to produce insurance cover, due to a lack of understanding and expertise. Accurate risk assessment is extremely difficult – and quantification of risk is one of the necessary characteristics of an insurable risk. Only once the risk is well understood, can coverage and suitable policy wordings be developed appropriately.

Also, for a risk to be insurable, risks need to be pooled and have a reasonable upper limit. In cyber risk there is a massive accumulation risk – and this has to be manageable across a whole portfolio of insurance policies.

These issues will probably become more significant as technology advances and the 'Internet of Things' widens. On the flipside, we can hope that as technology develops, the world gets better at understanding and tackling the risk.

It seems that cyber risk has become a large enough risk in its own right to allow insurers to offer a product designed specifically to cover it.

Lloyd's has begun attempting to assess cyber aggregations by asking syndicates to estimate their losses to individual market-wide scenarios (using the Lloyd's RDS regime). This provides some information on aggregations within and between syndicates, but is very crude in comparison to the detailed modelling of natural catastrophe aggregations, for example.

Cyber insurance is covered further in the Products Appendix.

8 Climate change

As a profession that has a focus on risk management, the potential impact of climate change is, and will continue to be, a major challenge for actuaries.

The risks from climate change are often classified into physical risks, transition risks and liability risks.

8.1 Physical risks

Physical risks are those arising from weather-related events, both directly (*eg* property damage) and indirectly (*eg* resources becoming more scarce).

Global temperatures are projected to continue to increase over the 21st century, leading to more extreme weather, ocean acidification and sea level rise. This will create new risks and amplify existing risks to humans and the environment.

At a high level, environmental changes affect the suitability of different regions for the survival of plants and animals, for the growth of different crops and for human habitation and economic activity. This will affect the likely frequency and severity of losses, particularly in property insurance and agricultural insurance. If insurance companies cannot effectively price and manage those losses, activities in those areas will become uninsurable and those regions will be uneconomical for investment. Alternatively, large industry or government schemes may be required, such as Flood Re in the UK subsidised by industry levies and the government-funded National Flood Insurance Program in the US. This approach can be problematic if it effectively involves subsidising risk-takers without also encouraging long-term investment in risk reduction.

The National Flood Insurance Program is a US government scheme that allows homeowners in flood-prone areas to purchase flood insurance cover from the government.

This can be contrasted with the UK Flood Re scheme, a non-profit levy / pool scheme run and financed by insurers, with financial support from the government in the event that an unusually large flood occurs. Flood Re is planned to eventually hand back flood coverage directly to insurers in the distant future.

Property catastrophe (re)insurers have a good knowledge of extreme weather systems: hurricanes, particularly those affecting North America, have been widely studied and a number of very detailed, comprehensive models exist for analysing the risks of these types of events. These models and insurers' understanding of these risks are constantly evolving, but overall these phenomena are relatively well understood: there is a significant body of both scientific literature and historical data surrounding these types of events.

This was covered in much more detail in Chapter 7, Catastrophe models.

However, historical climate patterns are changing due to global warming. Warmer seas lead to larger, more powerful hurricanes, while higher sea levels lead to larger, more dangerous storm surges.

Recall that storm surge is the rise in the level of coastal water above the usual tide level as a tropical cyclone moves over the water.

Existing wind and tidal processes may change, creating or destroying existing feedback loops within individual weather systems. This means that the historical record may no longer be so relevant when considering the range of possible outcomes.

8.2 Transition risks

Transition risks are the financial risks arising from a move to a lower-carbon economy.

Transition risks can arise from economic, political or social changes due to efforts to mitigate climate change, especially if these changes occur rapidly.

A key risk is the potential ‘stranding’ of assets in fossil fuel and related industries, where existing fuel reserves, infrastructure or drilling rights go unused due to reduced demand for, or restrictions on, fossil fuels. For a general insurer, this could impact the value of its investments as well as the experience of insurance it underwrites in those industries.

8.3 Liability risks

Liability risks are those arising from parties who have suffered loss, and seek to recover those losses from those they believe are responsible. The culpable party then makes a claim on its insurance, for example professional indemnity cover.

There have been an increasing number of lawsuits related to climate change. The majority have been brought against governments due to their responsibilities under existing laws as well as more recent climate legislation. However, private companies have also been sued for misrepresenting climate risk to shareholders or for inadequate environmental impact assessments. This is particularly relevant for general insurers writing D&O or public liability business.

Since the 2000s, attempts have been made by various injured parties to seek compensation from major fossil fuel companies for the impacts of climate change. Establishing liability requires attributing certain weather events to global emissions, which is a developing science, as well as establishing that individual agents were at fault. It is unclear whether a new class of liability claims will emerge from this area of litigation.

The interdependent nature of climate change risks creates additional challenges when assessing the aggregation of risks and the impact on an insurer’s business model. The changing climate is a common driver which could affect the experience of a large number of policies. Legislation and changing social attitudes towards climate change are common drivers which could affect whole markets.

This was mentioned in Chapter 4, Legislation.

There is huge wealth of information available on climate change. An excellent place to start is the IFoA’s website, which contains a reading library, webinars and further information to get you started:

<https://www.actuaries.org.uk/learn-and-develop/lifelong-learning/sustainability-and-lifelong-learning>

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