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Solvency II and Technical Provisions

What Will UK Actuaries Do Differently?

ROC Working Party

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To reserve stochastically, or not to reserve stochastically...

Article 76, paragraph 2: “The best estimate shall be equal to the probability weighted average of future cashflows, taking into account of the time value of money (expected present value of future cash-flows), using the relevant risk-free interest rate term structure.”

What does this mean?



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Where UK Actuaries will do things differently

Valuation	Binary Events	Reserving Process	Other
<ul style="list-style-type: none">Claims ProvisionsPremium Provisions	<ul style="list-style-type: none">DefinitionMeasurement	<ul style="list-style-type: none">TestingValidationEmerging experienceDocumentation	<ul style="list-style-type: none">Cash flowsExpensesBad debt

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1. Valuation – Claims Provisions

Deterministic Models	<ul style="list-style-type: none">Can still be used – but for how long?Ref. CP 39Use stochastic models for checking?
Expenses	<ul style="list-style-type: none">Should be includedBoth allocated and unallocated claims management expenses (ALAE & ULAE)
Reinsurance	<ul style="list-style-type: none">Should be gross of reinsurance
Uncertainty	<ul style="list-style-type: none">Binary events (more on later)InflationOther changes in demographic, legal, medical, technological, social or economic developmentAs cash flows, uncertainty as to timing includedOther – already included?Documentation of actuarial judgement

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1. Valuation – Premium Provisions

What is included?	<ul style="list-style-type: none">Future premium paymentsCash-flows resulting from future claims eventsCash-flows arising from allocated and unallocated claims management expensesCash-flows arising from ongoing administration of the in-force policies
What is NOT included?	<ul style="list-style-type: none">Profit in the unearned premium
Future Premium Payments	<ul style="list-style-type: none">What are these exactly?

These are not Unearned Premiums!

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1. Valuation - Premium Provisions:
a simple cash-flow example (1)

- Assume 1st July 1-year policy with uniform risk
 - Payments are paid in the month following the end of the quarter of occurrence
 - No discounting / risk margins
- Claim ratio = 72%
 - Total Premium = 100, payable by 40 on day 1 and 3 equal payments of 20 in the 1st month of the quarter

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Total
Premiums	(40)	0	0	(20)	0	0	(20)	0	0	(20)	0	0	0	(100)
Paid claims	0	0	0	18	0	0	18	0	0	18	0	0	18	72
Cash-flow	(40)	0	0	(2)	0	0	(2)	0	0	(2)	0	0	18	(28)
Premium Earning	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	0	(100)

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1. Valuation - Premium Provisions:
a simple cash-flow example (2)

UK GAAP Approach
Assets 82
Cash 42
Receivables 40

Liabilities 68
OS claims 18 (on earned)
UPR 50
Available Profit 14

Solvency II Approach
Assets 42
Cash 42

Liabilities 14
Claim reserve 18
Premium provision (4) = (40) + 36
Available Profit 28

Cash flows	Past	Future	Total
Premiums	(60)	(40)	(100)
Paid claims	18	54	72
Net cash-flow	(42)	14	(28)
Premium earning	(50)	(50)	(100)

- Main observations
- Provisions reduce drastically
 - All profit taken year 1
 - Premium provision is negative
 - No concept of non-monetary items

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2. Binary Events

Binary Events

- What are they?
- How can we possibly measure them?
- How should we include them in our claims provisions?

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2. Binary Events – What are they?

Health	<ul style="list-style-type: none"> Nanotechnology Aspartame Electro magnetic fields GM crops Nuclear waste 	
Events	<ul style="list-style-type: none"> Meteor strike Mega Volcanoes 	
Social / Environmental	<ul style="list-style-type: none"> Global warming Polluters 	
Legislative/ Political	<ul style="list-style-type: none"> "Step change" in court rulings (e.g. Ogden) "the greater good" e.g. asbestos, US Healthcare 	
Other	<ul style="list-style-type: none"> Contract wording etc 	

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2. Binary Events - Why Bother?

- Best estimate = Probability weighted average of **all** possible future cash flows
- Current methods probably underestimate a "true" mean
 - Data / parameterisation
 - Unknown unknowns
 - "Margin" used for binary events
- Binary events fill **part of** the gap between the current approach and the requirements

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2. Binary Events – Possible Approach

- Recognise bias introduced by incomplete information
- Not new concept
 - For example, CAS working party "we are skewed"
- Relatively simple approach
 - Includes expert judgement
 - Is possible
- Assumption by line of business
 - Aggregate distribution
 - Most severe event included in estimates / data (e.g. a 1:200 year event)

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2. Binary Events –
What could you be missing for Latents?

S2 Class of business	Selected distribution	Undiscounted Reserve uplift		
		99.0%	99.5%	99.9%
Credit & Suretyship	Lognormal	1.27	1.14	1.05
Fire & other property damage	Lognormal	1.11	1.05	1.00
Health other	Lognormal	1.15	1.08	1.00
Legal expenses	Lognormal	1.54	1.27	1.14
MAT	Lognormal	1.11	1.08	1.00
Motor other	Lognormal	1.10	1.10	1.00
Motor TPL	Lognormal	1.32	1.16	1.00
Third-party liability	Lognormal	1.12	1.07	1.02
NP reins casualty	Inverse Gaussian	1.36	1.22	1.05
NP reins MAT	Inverse Gaussian	1.18	1.10	1.03
NP reins property	Inverse Gaussian	1.22	1.11	1.04

- Health Warning – Illustrative numbers only – not S2 basis
- Not suggested factors

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2. Binary Events –
How to allow for them?

- Be explicit
- Net vs Gross
- Premium provisions
 - Link with pricing – cat & latent loadings
 - Consistency
- Claims provisions
 - Latent loadings
 - Link with pricing?
 - Run-off over time → discounting reduces impact?
- Consistency
 - Between lines of business
 - Between claims and premium provisions
- Proportionality

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2. Binary Events –
Potential wider impact

- Increase links with pricing
- Profit recognition
 - Could involve initial strains
- Management awareness
 - What is the message
 - Should they care?
 - Does that make sense to worry about events that will break you
- Higher premiums?

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3. Reserving Process

Data	<ul style="list-style-type: none">▪ Quality and availability▪ Higher level of data standards▪ Sufficient?
Analysis	<ul style="list-style-type: none">▪ Cultural change▪ Best estimate – no margins either explicit or implicit!
Validation	<ul style="list-style-type: none">▪ Back testing▪ Actual v expected
Governance	<ul style="list-style-type: none">▪ Greater control – peer review/external review▪ Justify to regulators that Technical Provisions are adequate▪ Board must demonstrate understanding and challenge of reserving process
Reporting	<ul style="list-style-type: none">▪ External – different reserves may be reported for different purposes and jurisdictions▪ Internal – may be more onerous re uncertainty and A v E

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3. Reserving Process – cont'd

Documentation	<ul style="list-style-type: none">▪ Higher standard will be required
Link to Internal Model	<ul style="list-style-type: none">▪ Same assumptions, methodologies and final numbers▪ Link to other solvency calculations
New Areas	<ul style="list-style-type: none">▪ Expenses – ULAE and ALAE▪ Lapses
Resourcing Requirements	<ul style="list-style-type: none">▪ Solvency II reserves required from Oct 2012 – in addition to normal reporting requirements, e.g. UK GAAP▪ How much extra work?
Standards	<ul style="list-style-type: none">▪ BAS?▪ What will the actuarial function sign off on?

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4. Other Issues

Cash Flows	<ul style="list-style-type: none">▪ For each line of business▪ Scenarios needed for differences in timing, e.g. large claims▪ For each item in the provisions (claims, expenses, reinsurance recoveries, premiums, etc.)▪ Does Paid pattern ever reach Incurred pattern?▪ Adjustments for changes▪ Sensitivity testing
Reinsurance Recoverables	<ul style="list-style-type: none">▪ Modelled and held separately▪ Own cash flows▪ Reduced for counterparty default risk
Expenses	<ul style="list-style-type: none">▪ Allocated cash flows▪ Unallocated expenses – both claims and overhead▪ Going-concern basis or run-off▪ May have to do both

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Going forward

- What sort of structure (e.g. for reporting) will emerge?
- IFRS?
- Improving stochastic methods, and consider for testing purposes
- CEIOPS advice to the Commission
- Timing of finalised Level 2
- Risk margins

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Top 10 things YOU will be doing differently

10. Reporting and professional standards
9. Increased frequency of calculation
8. Linking pricing, reserving & capital
7. Actuarial function
6. Processes
5. Methodology
4. Documentation
3. Expenses
2. Latent claims
1. Payment patterns / Cashflows

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