

The Actuarial Profession  
making financial sense of the future

GI ROC – Working party  
Momentum 2010 – Celtic Manor, Newport, Wales



**Reserving for Solvency II**  
**What you need to be doing**  
**NOW!**

10 December 2010

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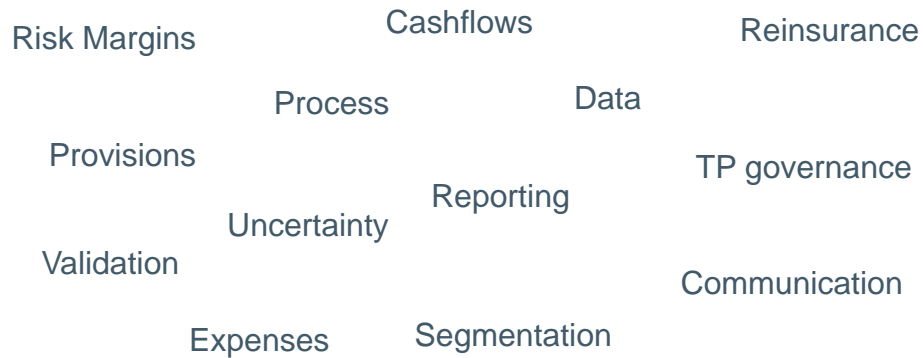
## GI ROC Working Party Members

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Naomi Al-Seffar  
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Kendra Felisky (Chair)  
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## GI ROC Working Party Reserving under Solvency II

Working party has a wide remit looking at practical implications of:



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- 1 • Process
- 2 • Reserving Under Solvency II
- 3 • Valuation & Validation
- 4 • Priorities

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## Process – the old way

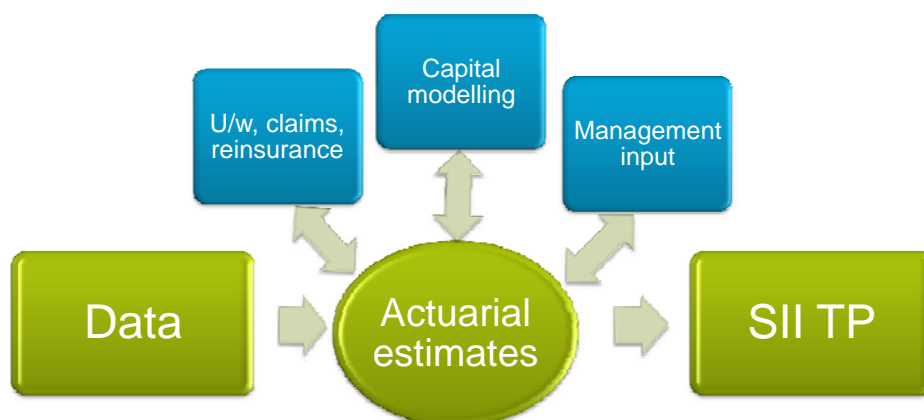


Booked provisions decided by management.

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## Process – under Solvency II

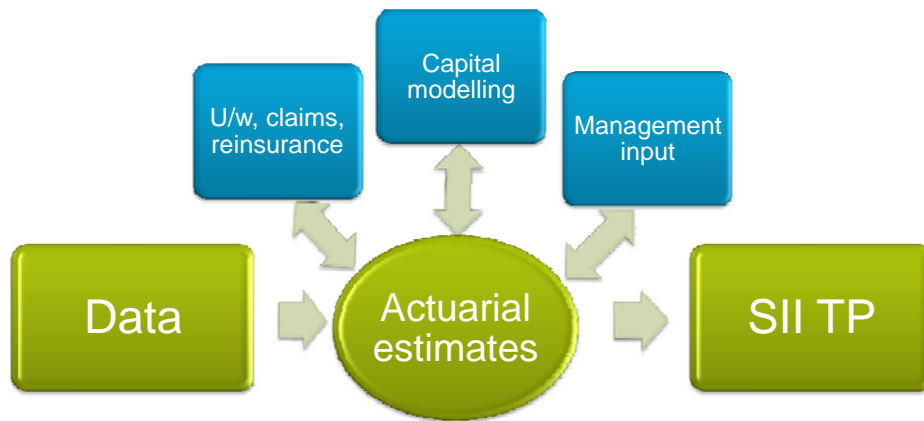


Booked provisions for Solvency II determined by the actuary.

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## Process – under Solvency II and IFRS Phase II?

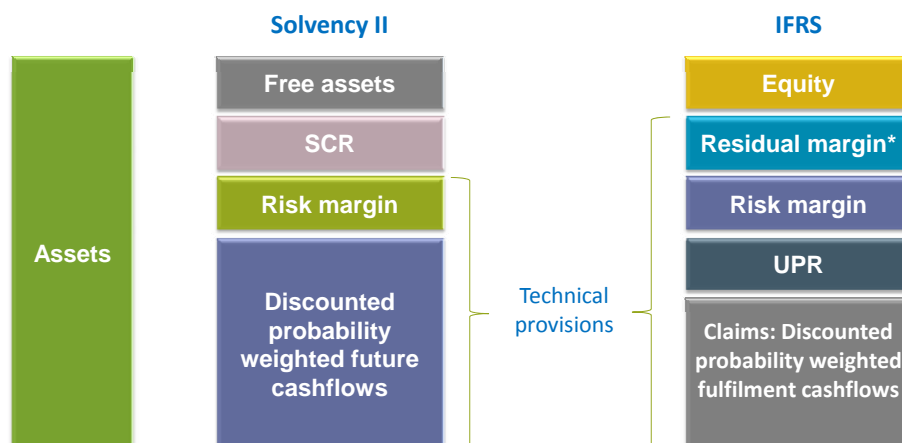


Booked provisions for Solvency II determined by the actuary.

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## Process – Solvency II vs IFRS Phase II



\* Residual margin is set to avoid a "Day 1 gain"

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## Process – Solvency II vs IFRS Phase II

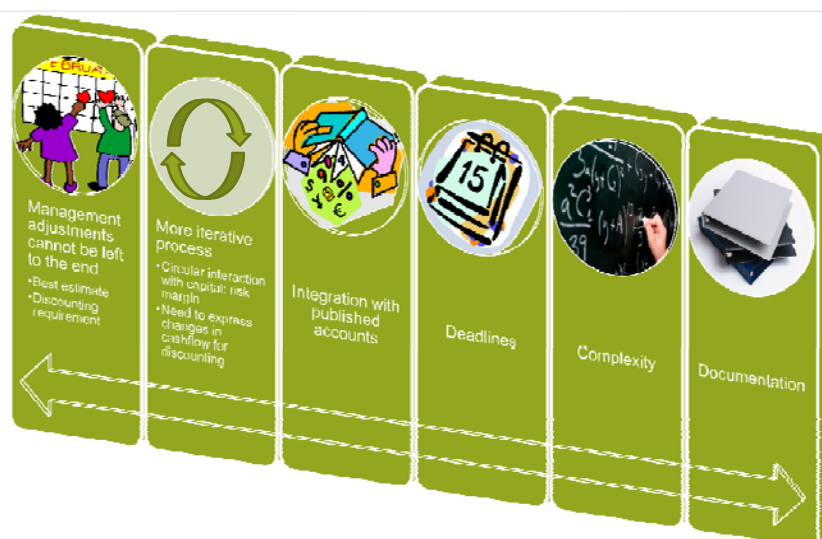
### The principal areas of difference



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## Process – Key changes



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## Segmentation

### *Article 80 - Segmentation*

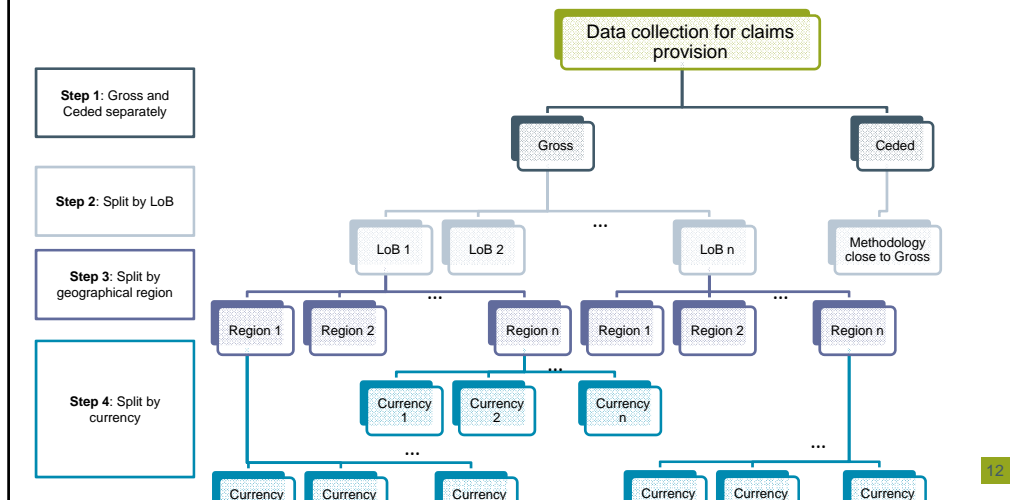
Insurance and reinsurance undertakings shall segment their insurance and reinsurance obligations into homogeneous risk groups, and as a minimum by lines of business, when calculating their technical provisions.

- Level 2 Implementing Measures further introduce "...by currency"
- Emphasis remains on homogeneous risk groups
  - ensures calculations at the "right level"
  - need to consider credibility
- May be similar to current splits of business
- Results can be allocated or aggregated to higher or lower levels as appropriate
- Consider link with internal model classes for risk margin calculation

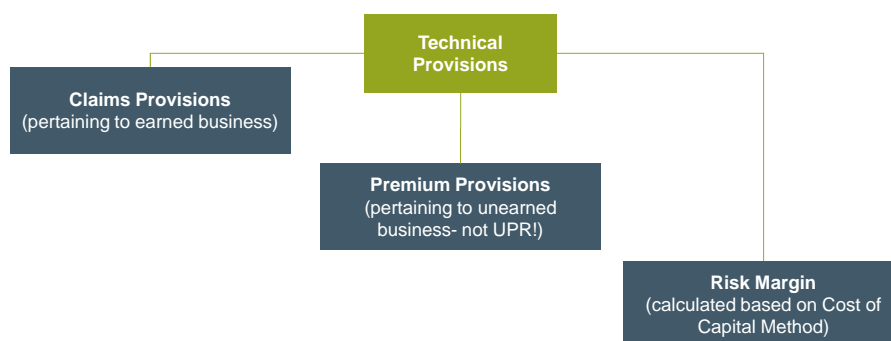
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## Segmentation

### QIS5 Technical Specifications and Spreadsheet Structure



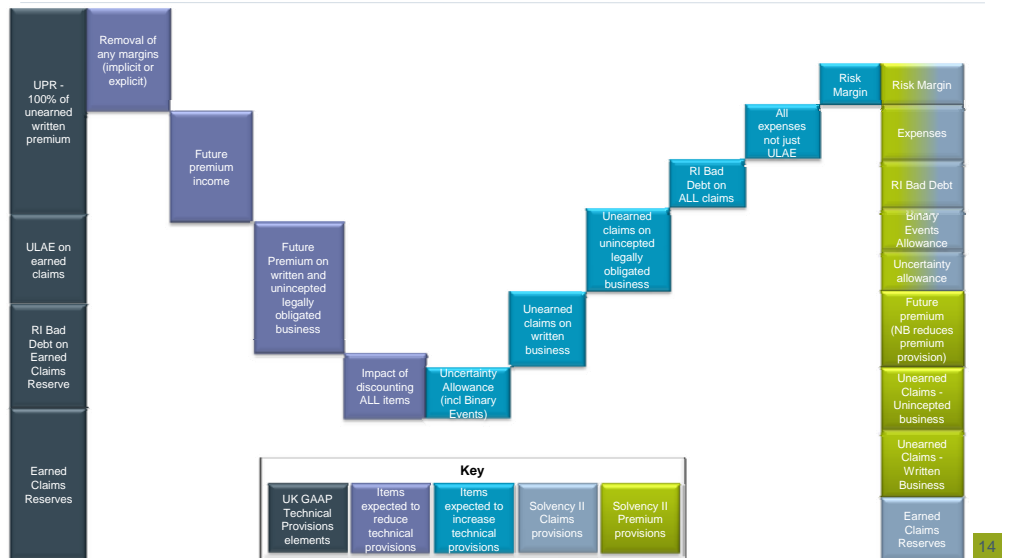
## What will “Reserving” look like under Solvency II?



The starting point continues to be the actuarial estimate. The actuarial and statistical methods to calculate technical provisions should be proportionate to the nature, scale and complexity of the risks supported by the undertaking.

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## Technical Provisions From UK GAAP to Solvency 2



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## Best Estimate

### Removal of any margins

Removal of  
any margins  
(implicit or  
explicit)

The best estimate should correspond to the probability weighted average of future cash-flows taking account of the time value of money.

Therefore the best estimate calculation should allow for the uncertainty in the future cash-flows BUT allowance for uncertainty does not suggest that additional margins should be included within the best estimate.

That means:

- No explicit buffer
- Claims provision based on realistic assumptions
- Premiums provision should account for any profits or losses on unexpired risk

How does one factor in management judgement?

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## Best Estimate

### Premium provisions

Future  
premium

Unearned  
claims on  
written  
business

Gross (and Reinsurer's share) UPR does not exist anymore under Solvency II. It is replaced by the premium provision:

Claims related to unexpired risk for existing contracts.

Less future premium cashflows.

The premium provision amount may be negative.

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## Best Estimate Premium provision

Release of  
profit on UPR  
unearned  
written  
premium

Unearned  
claims on  
written  
business

- 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 1<sup>st</sup> 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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## Best Estimate Unearned business

Release of  
profit on UPR  
unearned  
written  
premium

Unearned  
claims on  
written  
business

### UK GAAP Approach

<b>Assets</b>	<b>82</b>
Cash	42
Receivables	40
<b>Liabilities</b>	<b>68</b>
OS claims	18 (on earned)
UPR	50
<b>Available Profit</b>	<b>14</b>

### Solvency II Approach

<b>Assets</b>	<b>42</b>
Cash	42
<b>Liabilities</b>	<b>14</b>
Claim reserve	18
Premium provision	(4) = (40) + 36
<b>Available Profit</b>	<b>28</b>

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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## Best Estimate

### Written unaccepted business

Future Premium

Unearned claims  
on unaccepted  
legally obligated  
business

*Extract from DOC 25/09*

A reinsurance or insurance contract should be initially recognized by insurance or reinsurance undertakings as an existing contract when the undertaking becomes a party of the contract..... the undertaking becomes a party of the contract when the contract between undertaking and policyholder is legally formalized. In particular, the recognition may take place earlier than the inception of insurance cover, because from an economic point of view the obligation to provide cover already exists and has an economic value before the inception.

Move to a "legal obligations" basis

- big change
- will include 1/1 renewals for a 31/12 valuation
- need to consider notice periods on binders?

Data implications are significant

Future premiums means provisions for these will often be negative

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## Best Estimate

### Discounting ALL items

Impact of  
discounting ALL  
items

The best estimate should correspond to the probability weighted average of future cash-flows taking account of the time value of money.

Need to create cash-flows gross of reinsurance and for reinsurers' share separately.

Segmentation by line of business and currency.

Need to create cash-flows for:

- Claims payments (out)
- Expenses LAE, ULAE, overheads/admin, commissions (out)
- Future premiums (in)
- Receivable for salvage and subrogation (in)

Need then to discount these future cash-flows using the risk-free term structure for the relevant currency.

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## Best Estimate

### Cashflows, where to start?

Impact of  
discounting ALL  
items

#### Creating deterministic cashflows

- Is this the best starting point?
- What if you don't use triangles/chain ladder for reserving?
- Can you just start with triangles?
- Large losses will need separate consideration
- Actuaries should take care to avoid over-smoothing in their analyses
- Cashflows need to be the mean cashflows

#### Data

- Is suitable data available?
- What data should we be collecting now?
- Actuaries should consider the level of granularity they require to produce estimates that meet statistical quality standards of SII

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## Best Estimate

### Reserving versus capital modeling

Impact of  
discounting ALL  
items

The technical provisions need to be consistent with the internal model. This creates a number of challenges.

#### Earned reserves (claims provision)

- What methods make it easiest to ensure consistency between point estimates and means of stochastic distributions.
- Consideration of correlations.

#### Unearned reserves (premium provision)





- Typically the remit of the capital actuaries
- Need input from planning also

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## Best Estimate

### Uncertainty allowance – Binary Events

Uncertainty  
Allowance  
(incl Binary Events)

What are they?		Why bother?
Health	<ul style="list-style-type: none"> <li>Nanotechnology</li> <li>Aspartame</li> <li>Electro magnetic fields</li> <li>GM crops</li> <li>Nuclear waste</li> </ul> 	<ul style="list-style-type: none"> <li>Best estimate = Probability weighted average of <b>all</b> possible future cash flows</li> <li>Current methods probably underestimate a “true” mean               <ul style="list-style-type: none"> <li>Data / parameterisation</li> <li>Unknown unknowns</li> <li>“Margin” used for binary events</li> </ul> </li> <li>Binary events fill <b>part of</b> the gap between the current approach and the requirements</li> <li>Premium provisions</li> <li>Cat &amp; latent loadings – be consistent with pricing assumptions</li> <li>Claims provisions</li> <li>Latent loadings</li> </ul>
Events	<ul style="list-style-type: none"> <li>Meteor strike</li> <li>Mega Volcanoes</li> </ul> 	
Social Environmental	<ul style="list-style-type: none"> <li>Global warming</li> <li>Polluters</li> </ul> 	
Legislative/ Political	<ul style="list-style-type: none"> <li>“Step change” in court rulings (e.g. Ogden)</li> <li>“the greater good” e.g. asbestos, US Healthcare</li> </ul>	
Other	<ul style="list-style-type: none"> <li>Contract wording</li> <li>etc</li> </ul> 	

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## Best Estimate

### Uncertainty allowance – Binary Events

Uncertainty  
Allowance  
(incl Binary Events)

#### Methodology:

- Deterministic projection:
  - Estimate “mean” binary outcome
  - Explicitly adjust claims reserve
- Stochastic projection
  - Select distributions (frequency/severity) for binary loss and model cashflows
  - Model cashflows for standard losses in normal way (e.g. bootstrapping)
  - Combine cashflows from two projections

#### Results:

- Deterministic projection:
  - Binary “allowance” can be reduced to simple percentage increase in reserves
- Stochastic projection
  - Required increase in reserve is clouded by effect of discounting / reinsurance

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## Best Estimate

### RI Bad Debt on ALL claims

RI Bad Debt on ALL  
claims

This should approximate the expected present value of the losses in the event of default weighted by the probability of default for each counterparty.

It should take into account default events during the whole run-off period of the recoverables (i.e. it is not sufficient to multiply the expected recoveries by the probability of default over the current year).

It should be calculated separately for each line of business and separately for premiums provision and claims provision.

The aim is to get an expected probability of default and loss given default for each future time period for each line of business and each counterparty (or at least each rating group).

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## Best Estimate

### All Expenses

All expenses not just  
ULAE

Expenses cashflows incurred servicing existing policies during their lifetime, i.e. should include, for example:

- Acquisition expenses
- Claims management expenses
- Unallocated expenses (ULAE would be part of it)
- Investment management expenses

They should be allocated between lines of business, gross/ceded, currency and between earned and unearned exposure.

Expenses cashflows should be calculated on the assumption of an ongoing business basis and assumptions should be made for inflation.

The actuarial function needs to document the rationale for the allowance for expenses in the technical provision calculations.

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## Best Estimate

### Validation and other issues

Impact of  
discounting ALL  
items

#### Validation

- How do we validate / justify initial approach?
- How do we monitor, validate and apply P&L attribution on an ongoing basis?
- What will be acceptable to the regulator, and how will this line up with model validation?

#### Other issues

- Does bootstrapping cover all areas of risk
- Is your finance department ready for this?
- Reinsurance
- Groups

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## Best Estimate

### Reinsurance

Impact of  
discounting ALL  
items

#### Considerations

- When to use net to gross techniques
- Timing of payments
- Impact on bad debt calculations
- Which contracts to include
- Allocation of RI recoveries

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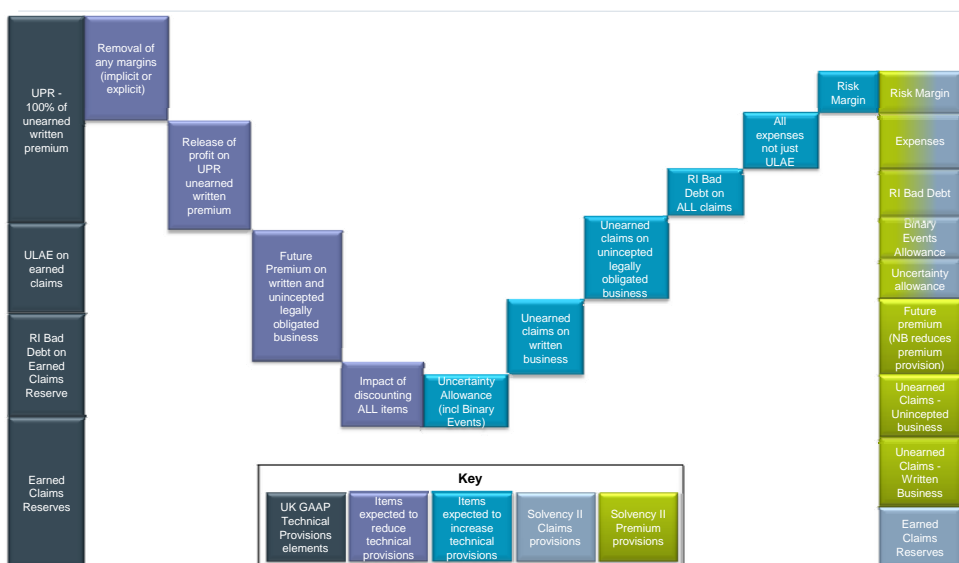
## Risk Margin

Risk Margin

- Amount required to ensure the value of the technical provisions is increased from the discounted best estimate to an amount equivalent to the theoretical level required to transfer the obligations to another insurance undertaking
- Where the best estimate and risk margins are calculated separately, risk margins should be calculated using a cost of capital approach
- This is a new concept compared to current practice and it is envisaged that RM will be calculated to some extent using suitable simplifications
- Should not be calculated separately for premium and claim provisions
- Should be defined net of reinsurance only. For IM can be calc gross and RI separately
- Cost of Capital rate is a 'long term' rate above the risk free rate, not adjusted for market cycle – 6% appears the 'magic number'

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## Technical Provisions From UK GAAP to Solvency 2 – You did it!



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## Priorities



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## Conclusions

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- Technical Provisions are changing significantly
  - Both quantitative and qualitative elements
  - Don't underestimate the work involved
- Dry run / QIS5 have happened but we're going to have to estimate technical provisions again soon
  - Technical provisions at year end and possibly every half year
  - Plan any changes from QIS5 methodology now
  - Remember it is an evolving area so be flexible
- Look out for updates from the WP whenever you can
  - There's more to come
  - And if you have ideas or comments then let us know

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## Questions or comments?

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