



ACTUARIAL SOCIETY
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Common ORSA modelling pitfalls

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**TIME FOR ORSA
AGAIN**

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Why revisit approach to ORSA

- Sometimes still **troublesome/clunky** process.
 - Ever **changing** and **emerging** risks.
 - **Changing regulations** to consider (Liquidity, IFRS17, SAM Phase 2 etc.)
 - **Regular findings** on ORSAs reviewed.
 - Too often a **tick-box exercise**. Limited application/value.
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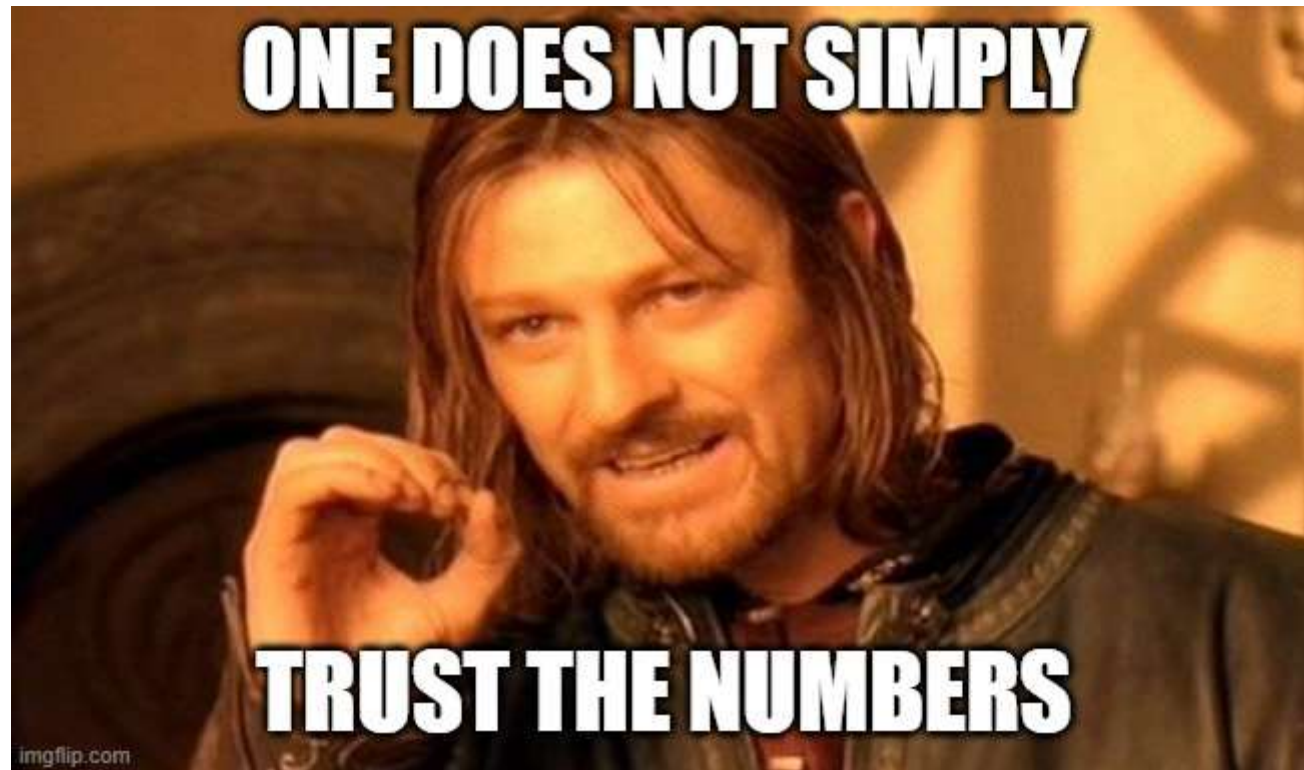


Key topics covered today

1. Challenging base projections
 2. Scenario design and modelling
 3. Actual vs Expected
 4. Model design and considerations
 5. Loss absorbing capacity of deferred taxes (“LACDT”)
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BASE PROJECTIONS





Challenges to base projection

The limitation:

- Base projections **taken as given** in ORSA.
 - Limited discussion around **feasibility** or how it could be achieved.
 - **Conservative? Aggressive?** Best-estimate?
 - Often owned by other departments. **Difficult to challenge.**
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Challenges the base projection

Consider:

- Ideally include **risk management function** in strategy sessions.
 - Benefit from **other views** in the process.
 - If base **not best-estimate**, **why** can we use it in ORSA?
 - Consider **adjusting base** ORSA projections.
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Limitations of base projections

- Base projections **less granular**.
 - **Actuarial rigor** present in the ORSA model.
 - New business/lapses; dependent variables (e.g., investment income)
 - End up with **non-sensible** model assumptions to match projections.
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Limitations of base projections

- Most ideal: **use ORSA model** for base projections.
 - Using a good model => **coherent and realistic projections**.
 - Alternatively, consider **model implications** in discussions.
 - **Better understanding** how to achieve targets and feasibility.
 - **Value-add** to other business functions.
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Scenario design, selection and modelling





Key thoughts

- Benefits in keeping **key sensitivities/stresses** consistent.
 - **Rotate** new scenarios over time. (3-6 in typically).
 - Consider **emerging/changing risks, hot topics** and **guidance**.
 - One key challenge to allow **sufficient detail** on emerging topics.
 - Rather go for **high quality**, but **low quantity scenarios**.
 - **Variety** of calibrations (1-in-10 year, 1-in-50 year, 1-in-200 etc.).
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Setting and choosing scenarios

- **No one-size-fits-all** solutions.
 - **Brainstorm** and **thoroughly** work through scenarios.
 - Model results raise questions: **scenario design** and **calibration**.
 - Modelers **apply their thinking** and **feed back irregularities**.
 - **Document** lessons learned to inform subsequent ORSAs.
 - ***Unpopular***: design and model more scenarios than what is needed.
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Quick note: model parameters

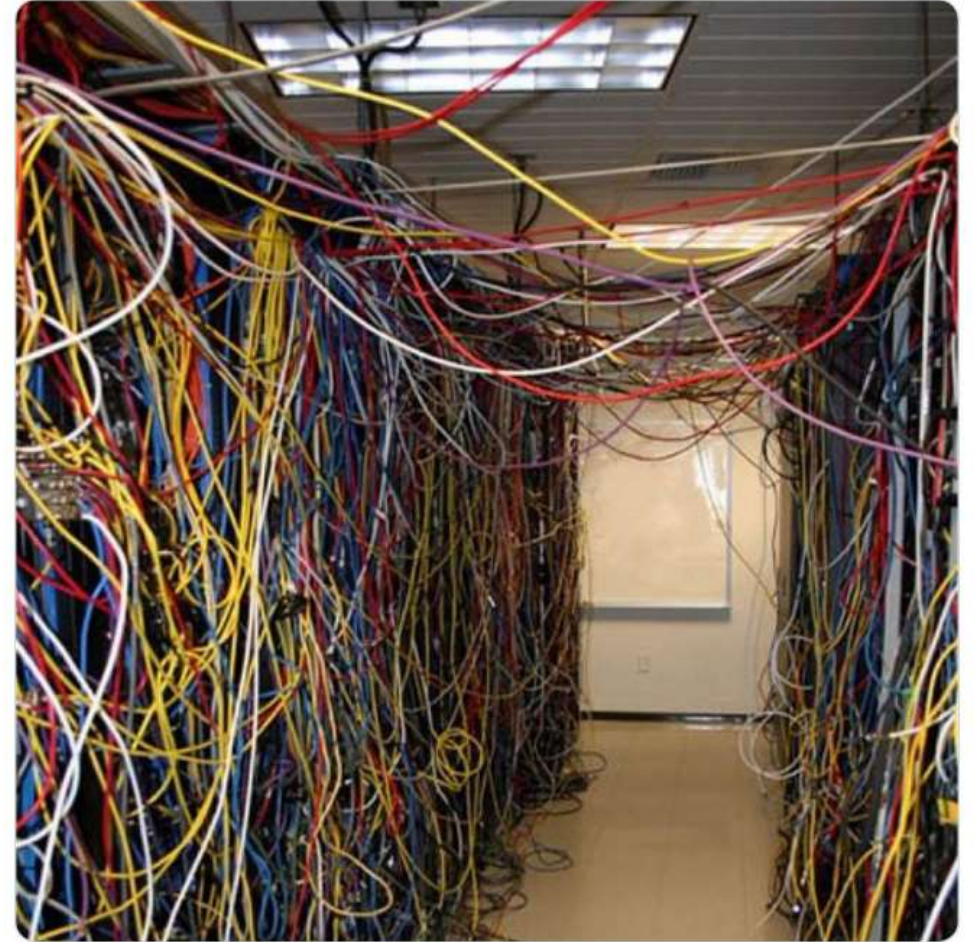
- High-risk areas -> documentation -> highlight to reviewers.
- **Reset** after manual adjustments when recycling.
- Easy to get **lost in translation**. **Independent** teams.

Scenario	Option A	Option B
30% increase in claims ratio	Claims ratio + 30%	Claims ratio * 1.3
10% increase in inflation	Inflation + 10%	Inflation * 1.1
40% increase in lapses	Lapse rate + 40%	Lapse rate * 1.4



Modelling design and considerations

that one spreadsheet everyone keeps updating every year and adding on formulas





Model design

- **Technology** is ever changing. **Good** current **understanding**.
 - **Not** advocating for fancy, powerful models.
 - Life insurers might require more powerful models.
 - For NL, **reducing human time and error** is key.
 - **Easy** to update, **not so easy** to break.
 - **Faster turn around** = more useful and less painful.
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Model design

- Ultimately best to tackle on **case-by-case** basis.
 - **Balance** between **parameters** and **tweaks** in the model
 - Sufficient **checks and controls**.
 - **Parameters**: easy to update, easy to understand.
 - Model at **sufficient granularity**.
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The use of proxies: bad idea?

- Less **complexity**, **faster** and **easy** to develop.
 - Good approximations, often **break down under stress**.
 - **Reduce flexibility** and **restricts** the **modelling** of some scenarios.
 - Some (problematic?) examples we have seen:
 - **Investment income** as % of **premium** or % of **own funds** or % of **assets**.
 - **NLUR** as % of **net/gross premiums**.
 - **Market risk** as % **own funds/assets**.
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Some thoughts on proxies

- Use proxies but consider underlying drivers (especially under stress).
 - Split by characteristics.
 - Lines of business, market risk sub-components etc.
 - Checks for appropriateness can be done **out of cycle**.
 - **AvE**: Useful to **validate approximations** used.
 - **Key assumption** that impacts result.
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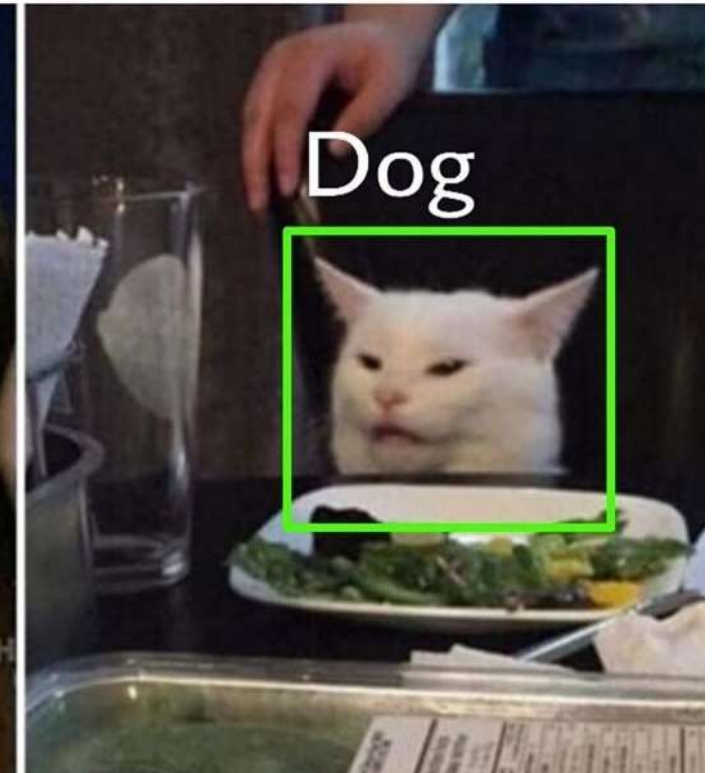


Actual vs. expected

People that say
that AI will take
over the world:



My own AI:





Par 10.2(b) of GOI 3.1

“...detailed information on the **actual outcomes** of applying the ORSA over the period, **relative to the planned outcomes in the previous ORSA report...**”



ORSA AvE: doing it right

- **Sufficient granularity.** E.g. SCR in conjunction with own funds
 - Not only compare emerging experience, **include AvE projections.**
 - Using AvE to inform **better future base/scenario setting.**
 - **Feedback loop** for other parts of ORSA.
 - **Leverage** from other departments already doing this.
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LACDT





LACDT: the basics

- **BOF** = Basic own Funds = **Assets – Liabilities**
 - $\Delta\text{BOF} = \text{BOF}_0 - \text{BOF}_1 = (A_0 - L_0) - (A_1 - L_1)$
 - A+L includes deferred tax assets (**DTA**) and deferred tax liabilities (**DTL**)
 - **Base LACDT** -> Considers the change in net DTL/DTA post SCR event
 - Decrease in net DTL / increase in net DTA contributes to higher LACDT
 - **DTL** easy to allow for. **DTA requires more care.**
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LACDT: the basics

- Very **limited guidance** from PA (Attachment 5 of FSI 4)
 - Only **3 years of profits** to recover DTA post-stress.
 - **80% of profit** in any year can be offset against tax losses.
 - Almost a **third reduction** on SCR.
 - Significant **judgement**, no **diversification**.
 - Tax rules are **complex**. Are we suited to do this?
 - Easy to **understate/overstate** the SCR, especially with ORSA!
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LACDT: ASSA Information note

- Drafted information note by LAC but **applies to NL too.**
 - **Tax funds** (*Less complex for NL*).
 - Assumption of **going concern.**
 - Post-stress **projections.**
 - Post-stress **management actions.**
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LACDT: NL tax funds

- Not as many tax funds as life insurers
 - Tax split: 'capital gains/losses' and 'operational profit/losses'
 - Tax on **capital losses** are ring-fenced
 - **Operational income tax CANNOT** offset DTA with respect to **capital losses**
 - **Capital gains tax** can offset DTA with respect to **operational losses**
 - **Losses from market loss => raise DTA from tax on future capital gains only.**
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LACDT: Going concern concept

- Can insurer meet **SCR** and **MCR** cover **post-stress**?
 - If not, **how long** would it take?
 - How will this **impact business**, now with weaker solvency?
 - **Very subjective** in nature.
 - **Careful** about **assumptions** post-stress.
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LACDT: Going concern concept

R'm	Before 1-in-200 shock	After 1-in-200 shock	Comment
Assets	40	29	
DTA	5	9	Increase by 27% of SCR
Other assets	35	20	Reduce by SCR
Liabilities	10	10	
Own funds	30	19	
OF eligible for SCR	30	12	Tiering limits applied
SCR	15	15	
SCR cover	2.0	0.8	
SCR shortfall	-	(2.75)	



LACDT: Modelling mistakes

- **Modelling of DTA/DTL** changes under ORSA stresses.
 - Not allowing for **tax funds/sources**.
 - Considerations of **LACDT** under **ORSA scenarios**.
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LACDT in ORSA: modelling of base DTA/DTL

Key thoughts:

- Base position could have either **DTA/DTL**.
 - Typically, **very little attention** given to DTL/DTA in projections.
 - Adverse scenario could lead to **reduction of DTL** or **raise of DTA**.
 - Ultimately, consider **recoverability** when **raising DTA**.
 - **Potentially recoverability rules** under projected results vs. LACDT.
 - **LACDT**: require **excess profits** to recognise further DTA after SCR stress. (**now 3-year rule**)
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LACDT in ORSA: modelling of DTA/DTL (no tax funds)

Key concept: consider recoverability when raising significant DTA (tax expert)

Scenario 1 (least adverse):

- Large DTL on B/S.
- Assessed losses occurs under stressed scenario.
- Losses => reduce DTL.
- No DTA raised on B/S.
- Easy -> Just reduce DTL

Scenario 2 (somewhat adverse):

- Small/zero DTL on B/S.
- Assessed losses occurs under stressed scenario
- Losses => extinguish DTL, DTA raised.
- **Special care** -> DTA test for recoverability (less stringent).
- **Capped @ 80% of tax on future profits**

Scenario 3 (most adverse):

- DTA under base.
- Assessed losses occurs under stressed scenario.
- Losses => DTA increase.
- **Special care** -> full DTA not recoverable given profits.
- **Capped @ 80% of tax on future profits**



LACDT in ORSA: simple example scenario

- Adverse event => assessed loss => raise DTA of R15m (ignore tax funds -> everything operations)
- **DTA** before adverse event = **R5m**
- **Maximum DTA** we can raise is **R20m**
- Expected profits **following event** (assume 3-year profit rule for B/S):

R'm	Year 1	Year 2	Year 3	Total
Profit for the year	15	20	50	85
<i>Available to offset</i>	<i>80%</i>	<i>80%</i>	<i>80%</i>	<i>80%</i>
Offsetable profit	12	16	40	68
Tax recovery @ 27%	2.9	3.8	9.6	16.3

- Can only recognize DTA of **R16.3m** in projections!



LACDT in ORSA: example scenario (tax funds)

- Adverse event => assessed loss (capital loss) => raise DTA of R15m

R'm	Year 1	Year 2	Year 3	Total
<i>Operational profits</i>	5	8	35	48
<i>Capital gains</i>	10	12	15	37
Profit for the year	15	20	50	85
<i>Offsetable profit (operational)</i>	4	6.4	28	38.4
Tax recovery (operations) @ 27%	1.0	1.5	6.7	9.2
<i>Offsetable profit (capital gains)</i>	10	12	15	37
Tax recovery (capital gains) @ 21%	2.1	2.5	3.2	7.8

- Total DTA = R5m (operational) + R7.8m (capital) = R12.8m**



LACDT in ORSA: modelling of LACDT

Key thoughts:

- Stressed position potentially have **reduced DTL** or **raised DTA**.
 - Portion of expected profits **already 'used'** for DTA under scenario.
 - Uncertain which portion used and which years => **not make sense to not use 3-year rule**.
 - **LACDT** => Assumes a **further SCR** event occurring
 - Insurer needs to be a going concern after SCR stress.
 - Sufficient 'excess' profits (**tax funds**) available to raise further DTA.
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LACDT in ORSA: modelling of LACDT

Key concept: consider recoverability when **raising DTA**

Scenario 1 (least adverse):

- Reduction in DTL or **raise small DTA** under scenario.
- **Insurer still going concern after SCR stress.**
- **Excess profits after SCR event**
- **Allow for LACDT** based on extent insurer can raise DTA.

Scenario 2 (somewhat adverse):

- Extinguish DTL.
- Raise base **DTA** as profits still expected.
- Going concern after SCR in question.
- **LACDT (likely smaller)** depending on excess **profits**.

Scenario 3 (most adverse):

- Extinguish in DTL.
- Base DTA in question.
- Insurer not going concern after SCR stress.
- No 'excess' profits.
- **No LACDT (maybe negative?)**



Summary

1. Challenging base projections
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Thank you



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