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Internal Model Validation – Keeping it Fresh

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Agenda

Considering validation from 3 angles:

1. **Strategic**
2. **Technical**
3. **Resource**

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Strategic view

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Strategic view

Q.	How is your model supporting your strategy?
1.	Clear objectives
2.	Top-down validation
3.	Understanding model limitations
4.	Key performance indicators

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Model use and governance

1.	Which model outputs feed into business decisions, other than the 99.5th percentile?
2.	How much validation and challenge occurs on these other outputs?
3.	Which model limitations are most relevant for each model use?
4.	How well are these limitations communicated and understood across the business?
5.	How effective is the model challenge feedback process in practice?

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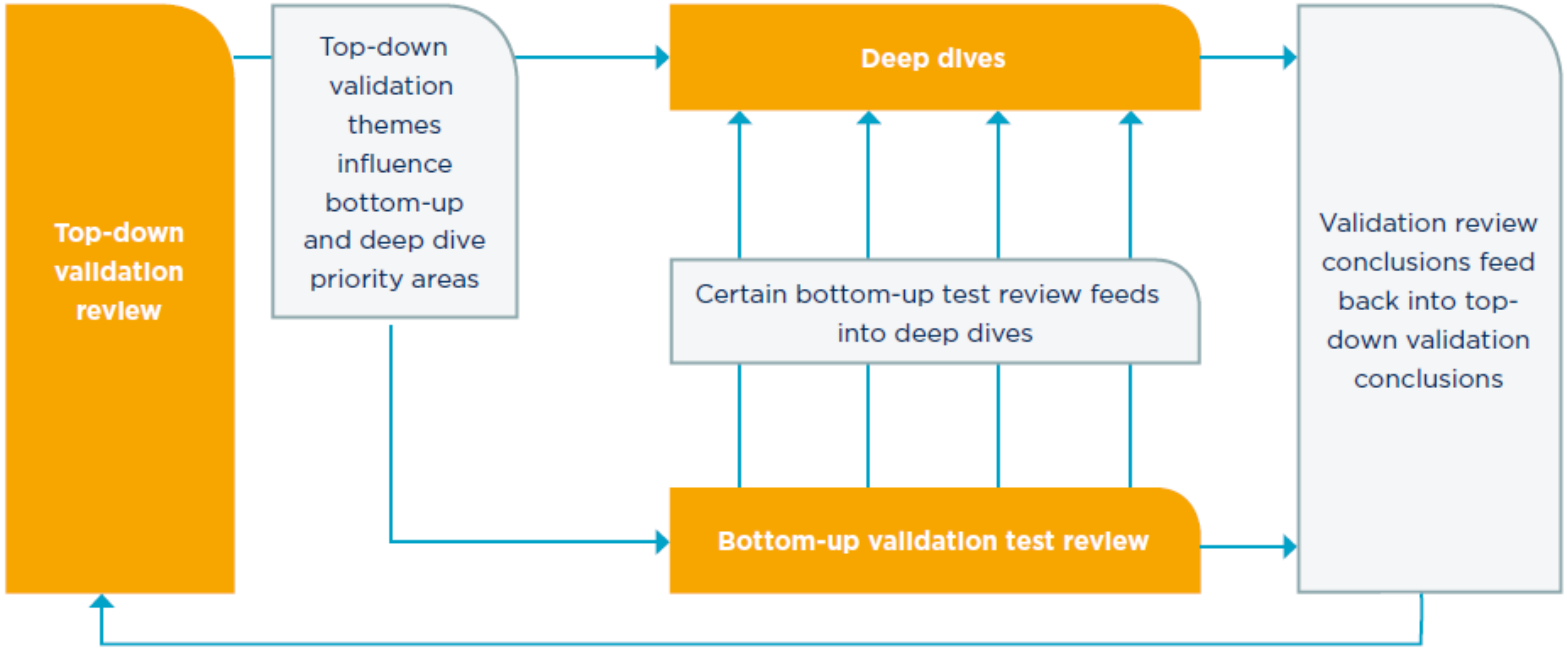
Model use and governance

Model use	Key metrics	Materiality of model output in decision making	Relevant tests (number / percentage)		Key test types considered
Capital	SCR	**High**	120	100% of total testing	All
Risk management (ORSA)	99% TVaR 1 in 5	**High**	24	20% of total testing	Scenario tests Sensitivity tests
RI purchase	1 in 5, 1 in 20, 1 in 100	**Medium**	8	25% of total UW risk testing	Reconciliation checks Reasonableness checks
Pricing loadings	99% TVaR	**Medium**	4	12.5% of total UW risk testing	Scenario tests Reasonableness checks
Investment decisions	90% TVaR	**Low**	4	50% of total market risk testing	Scenario tests Sensitivity tests Reasonableness checks
Business planning and strategy	Mean loss 1 in 5 upside 1 in 5 downside	**High**	12	37.5% of total UW risk testing	Backtesting (for mean) Scenario tests (for return periods)
Aggregation monitoring	99% TVar	**Medium**	6	50% of total Cat risk testing	Scenario tests Sensitivity tests

Top-down validation



Top-down validation

Q1	What are the main drivers of risk within the business? Are they appropriately captured in the model?
Q2	What are the elements of the methodology that have the greatest impact on the internal model results?
Q3	What are the key drivers of dependency and how are these reflected in the model?
Q4	What are our 5 most material assumptions? How can we manage reliance on them?
Q5	What are the key limitations of our model and why? What could make these limitations worse?
Q6	What are the key data inputs to the model and how do we ensure this data is high quality?
Q7	Why do we use external models and how do they impact our internal model results?
Q8	Are the internal model results appropriate? How does the SCR compare to other key measures?
Q9	What are the most significant findings of the validator and how have these been addressed?

Q4a	To what extent are the model assumptions driven by data vs subjective judgement?	
Q4b	How does our use of expert judgement compare with others in the market?	
Q4c	Who is involved in making expert judgements? How do we reconcile differing views, how do we bring data and expert views together, and how do we justify the final decision?	
Q4d	What is an appropriate range of possible assumptions? Where does our judgement lie within the range?	
Q4e	How could the assumptions foreseeably change in the future and how are we measuring their appropriateness over time?	
Q4f	How do we identify and assess implicit (as opposed to explicit) expert judgements?	
Overall assessment		

Top-down validation

Key:
5,2,1 5 pass, 2 pass with limitations, 1 fail
★ Key test

		Model area									
		Overall result	Premium risk	Catastrophe risk	Reserve risk	Credit risk	Operational risk	Market risk	Dependencies	1- year SCR	Reinsurance
Level of validation			Deep dive	Light touch	Deep dive	Deep dive	Deep dive	Light touch	Deep Dive	Light touch	Deep Dive
Areas	Parameterisation		★ 5,2,1	★ 5,1,0	5,2,1	★ 0,0,1	1,2,0		★ 5,0,0		0,0,1
	Methodology		7,0,0	★ 5,2,1	5,0,0	5,0,0	1,0,0	★ 5,0,0	★ 0,2,0	1,2,0	1,0,0
	Governance		0,0,1	★ 1,0,0	3,0,0	5,0,0	1,0,0	0,2,1	8,0,0		5,2,1
Validation test types	Risk ranking		1,2,0	★ 3,1,0		0,0,1	0,2,1		★ 9,0,0	★ 5,8,0	
	Reverse stress test		★ 2,0,0		5,0,0						5,2,1
	Analysis of change		0,4,1	9,0,0			0,0,1			5,0,0	
	Backtesting		★ 0,0,1	★ 6,0,0	★ 0,1,0	0,7,1				0,0,1	
	Reasonableness check		★ 1,0,0	0,0,1	0,2,0		3,2,1			0,2,0	
	Reconciliation checks				5,0,0			6,2,0			2,0,0
	Scenario testing		10,1,0	5,0,0							
	Sensitivity testing		0,2,1		★ 7,0,0			★ 9,2,0		0,2,0	
Other	Board recommendations										
	Model uses										
	Regulatory feedback										
Overall result			26,11,5	34,4,2	30,5,1	10,7,3	6,6,3	20,6,1	22,2,0	11,14,1	13,4,3

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Technical view

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Technical view

1. Technical challenges
2. Management actions
3. Regulator focus
4. Active model development
5. What if we did it differently?

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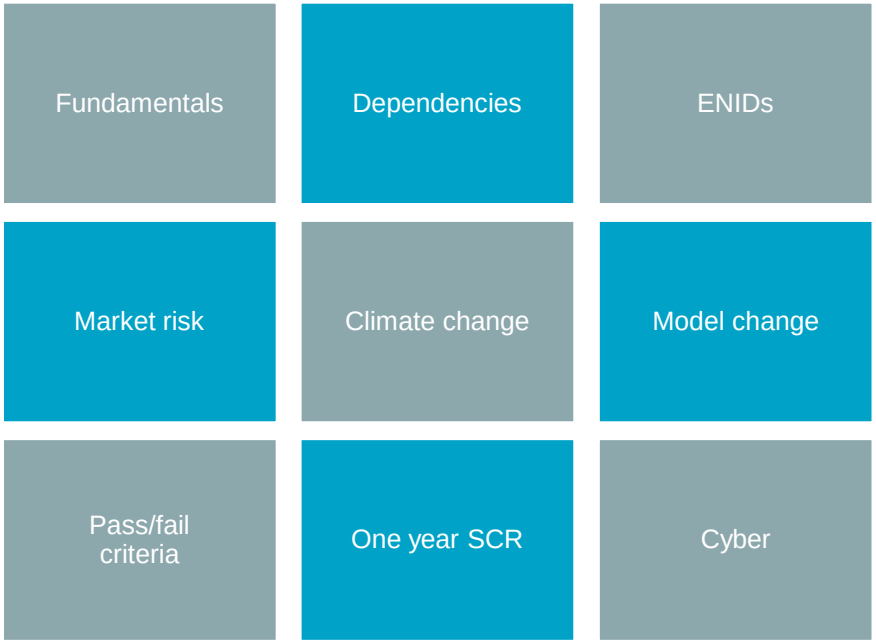
Withstanding regulatory fire



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Validation priorities

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Alternative methodologies

1. **Underwriting risk parameterisation:** Prospective vs retrospective
2. **Reserve risk:** Gross to net volatility
3. **“Double blind” re-parameterisation**
4. **Market risk:** Scenario-based approach
5. **Dependencies:** Alternative hierarchies, driver-based analysis

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Resource view

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Resource view

1. Rotation
2. Automation
3. Independence
4. Timescales

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Automations and efficiencies

"Our automated processes have massively reduced the number of manual errors – but it can introduce possible systemic risk"

"For us, the benefit of automation is to maximise time for quality thinking"

"If I can automate the processes, it will help reduce my current resource constraints"

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Validation backlog

Collate all outstanding feedback

- ✓ **Validation** findings
- ✓ **Regulator** feedback
- ✓ **Peer group** studies

Classify recommendations by actions required

- ✓ **Process** updates
- ✓ **Validation** updates
- ✓ **Model** updates

Target a balance of quick wins and strategic developments

- ✓ **Check** recommendations are still relevant
- ✓ **Group** common themes
- ✓ **Establish** clear plan

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Benefits of keeping validation fresh

Making more informed business decisions with confidence

Increased Board engagement which ensures validation adds value

Meet the regulators' high standards and market best practice

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Strategic, technical and resource views on validation

Model use and governance

Withstanding regulatory fire

Automation and efficiencies

Top down validation

Alternative methodologies

Validation backlog

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Questions

Comments

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