



Institute  
and Faculty  
of Actuaries

## Getting comfortable with dependencies

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### Why are dependencies so tough?

Complex  
structure

Not  
intuitive

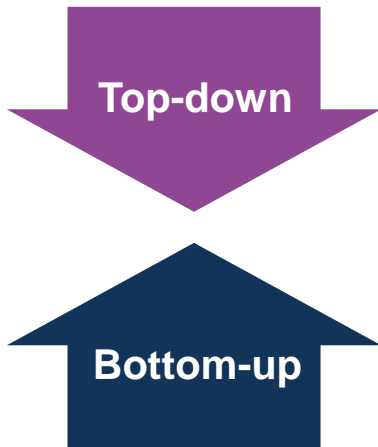
Limited  
data

Multiple  
owners

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## Dependencies validation

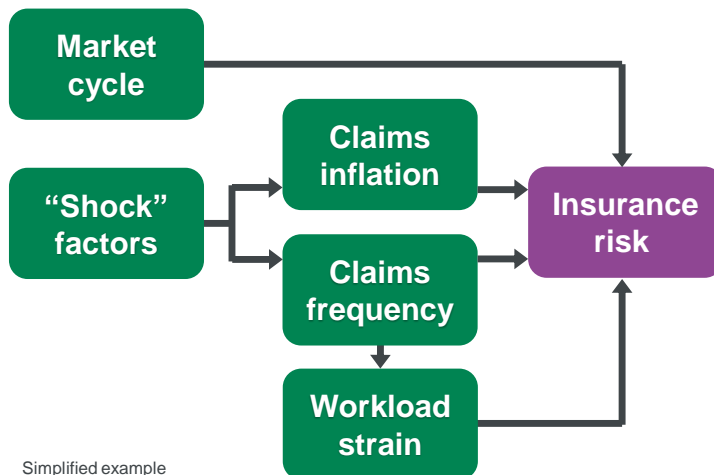


- What turns the dials?
  - Driver based analysis
  - Scenario testing
  - Sense check
- 
- Sensitivity testing
  - Stress testing
  - Benchmarking
  - Input/output testing

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## Validating using driver based model



Simplified example

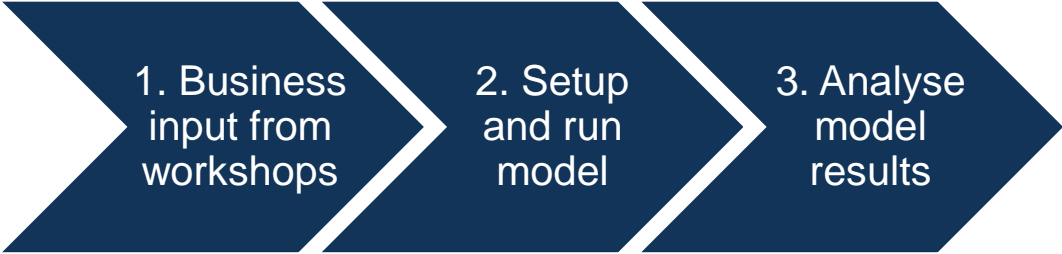
### Three key features:

- 4-dimensional "heartbeat":
  - Inception time
  - Accident time
  - Reporting time
  - Payment time
- Individual risks consistent with internal model
- Tangible judgements

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# Practical steps

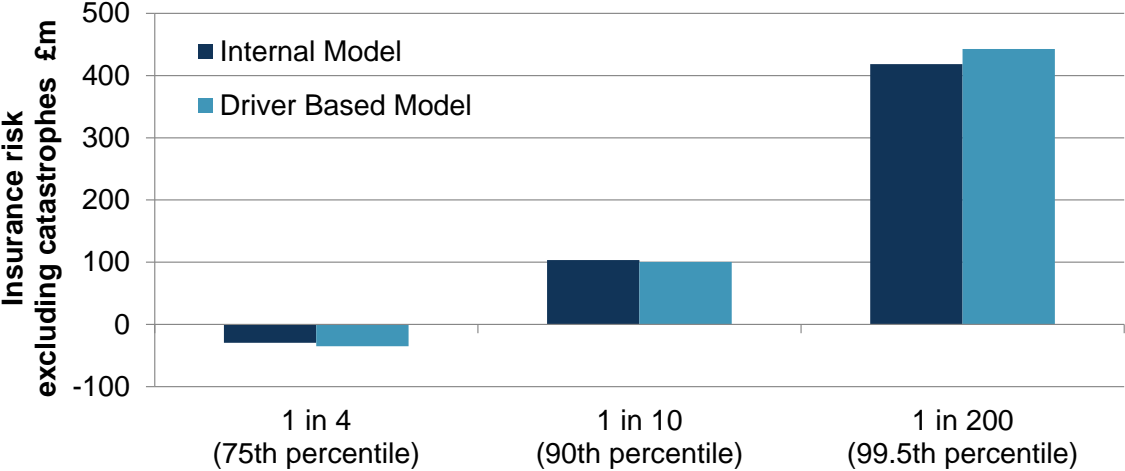


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# Comparison of headline results

Internal model vs. driver based model

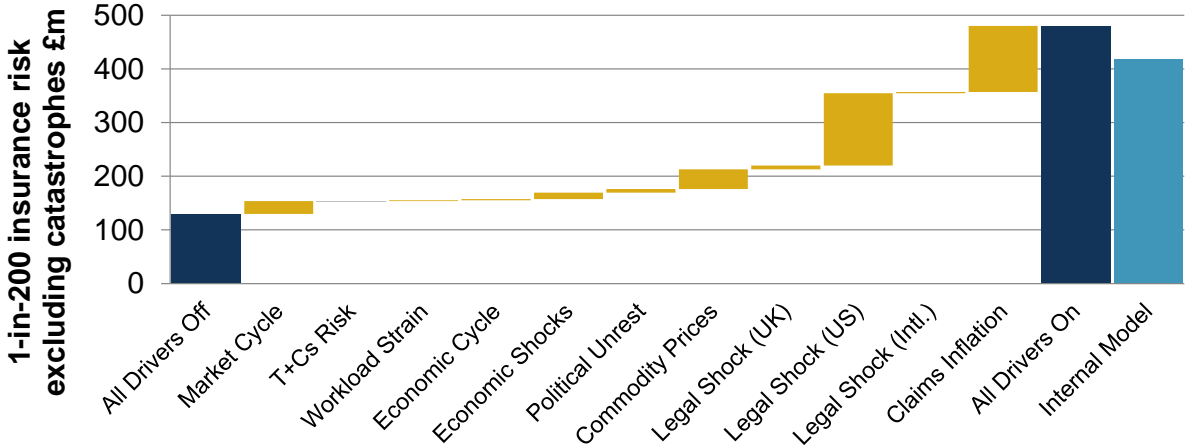


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# Waterfall build-up

Build-up of risk at 99.5th percentile (turning on each driver in turn)

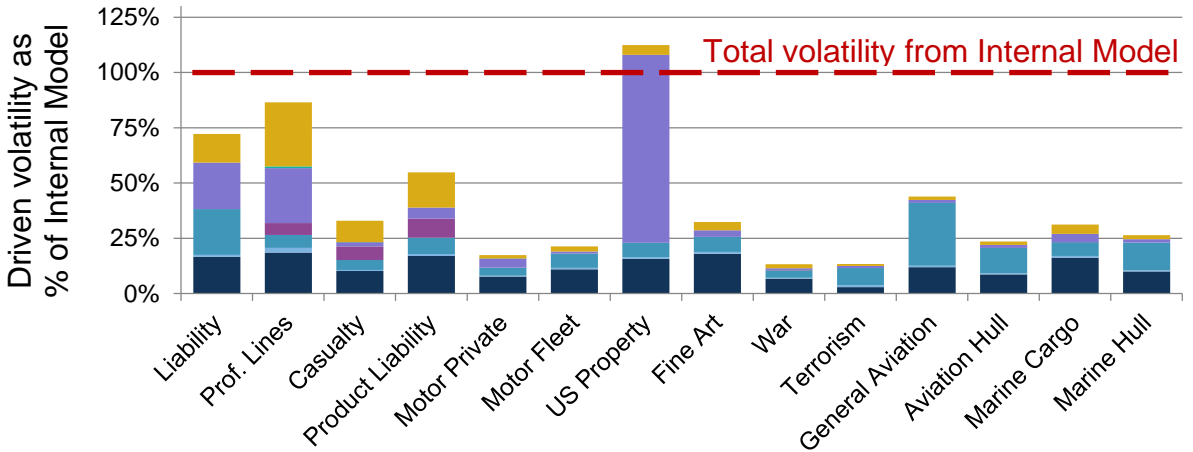


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# Volatility build-up

Build-up of volatility (turning on each driver in turn)

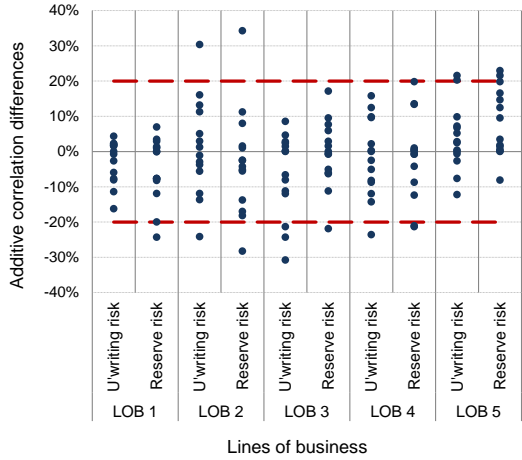
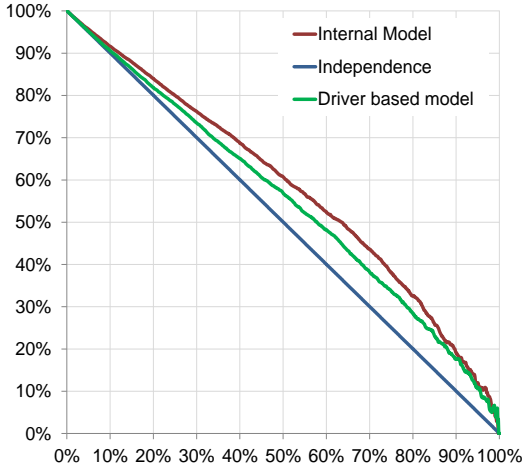


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# Other example diagnostics

## Conditional exceedance and correlation comparisons



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# Next steps

Output	Validation	Wider applications
	<p>Overall capital assessment</p> <p>Body risk validation</p>	<p>Supporting model use at different percentiles</p>
	<p>Risk ranking</p>	<p>Prioritising risk management</p>
	<p>Key driver analysis</p> <p>Pass/fail criteria</p>	<p>Portfolio optimisation</p> <p>Emerging risk management</p>

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**Questions**



**Comments**

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.

