

Who are we?

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- PhD, Financial Mathematics
- Expert on quantitative analytical techniques for operational risk in financial services
- Founder, **MC+**

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- Microeconomist, strategist
- Authority on uncertainty and risk as economic and commercial problems
- Director, **MC+**

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Four key messages about operational risk

- Most firms can **save money** on their operational risk capital –a lot of people leave money on the table
- Risk management should be **dynamic** – firms should build operational risk in to the management process
- Operational risk is **inherently complex**; you cannot escape complexity
- Using the right tools enables essential complexity to be **embedded in the tool** not the process

Why is operational risk different?

- Traditional risk methods – probability x impact – offer no help with capital modeling
- Most operational risk management effort is wasted
- We need another approach
- **Simulation using plausible scenarios** is both practicable and useful
- Simple with the right tools
- Static versus dynamic (i.e. risk sensitive approach)

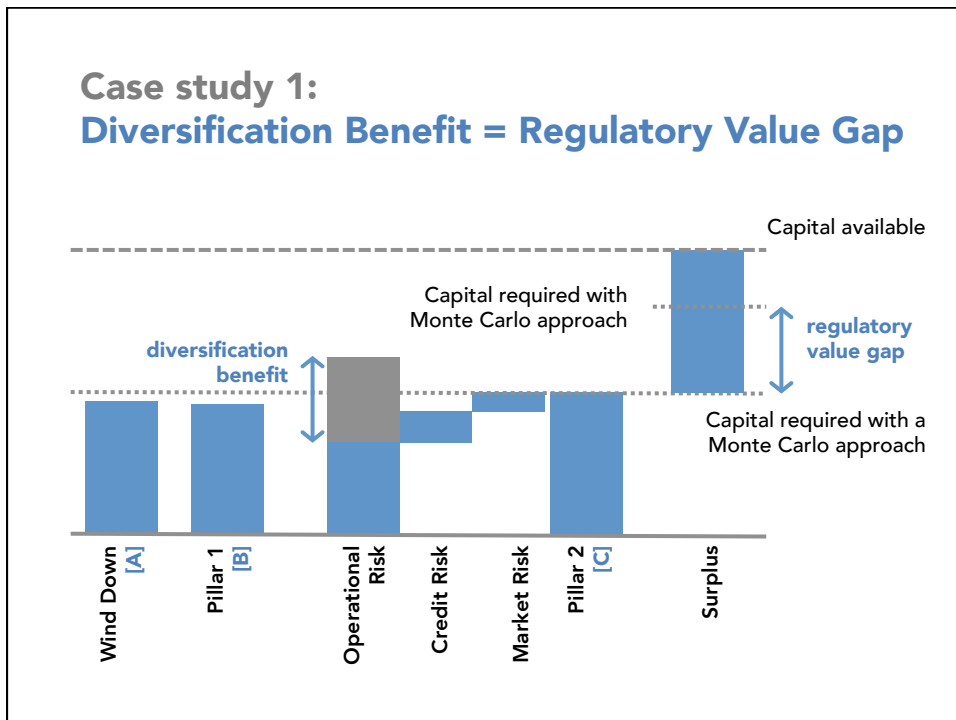
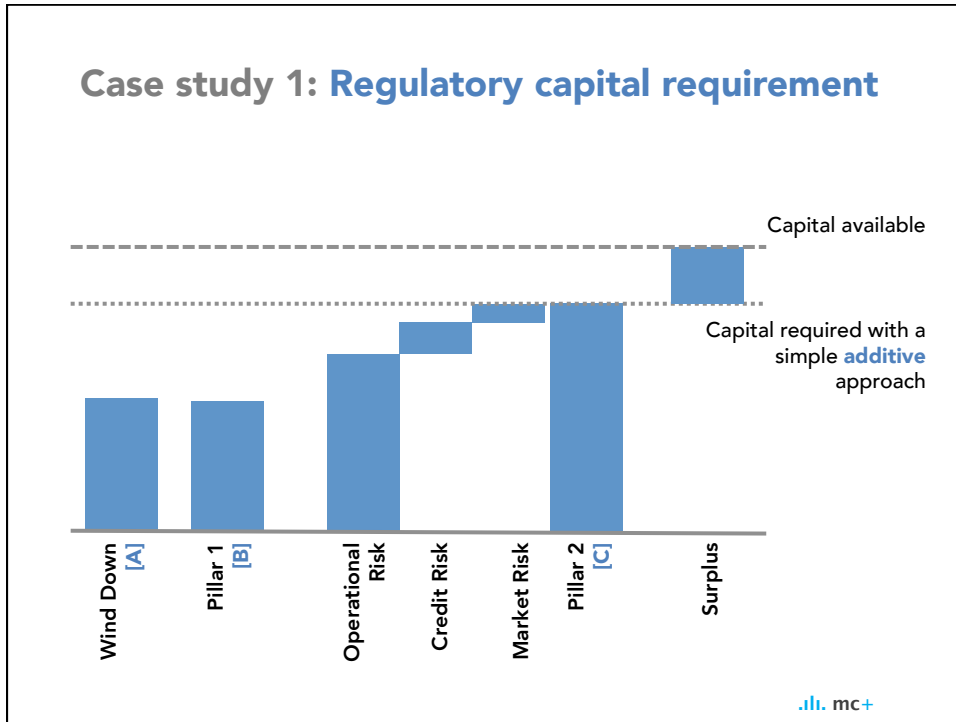
Dealing practically with operational risk

- How to combine operational risks
→ **Regulatory value gap**
- Need to understand individual risk scenarios and correlations between them
- Example of operational losses:
expected vs **unexpected** losses
- Explaining simulation
- 3 case study examples

Case study 1

Mid-tier investment management firm

- Naïve approach to operational risks → simply additive
- Realised they were leaving money on the table
- Recognised the need to move from a static, risk-register-based approach to a simulation approach

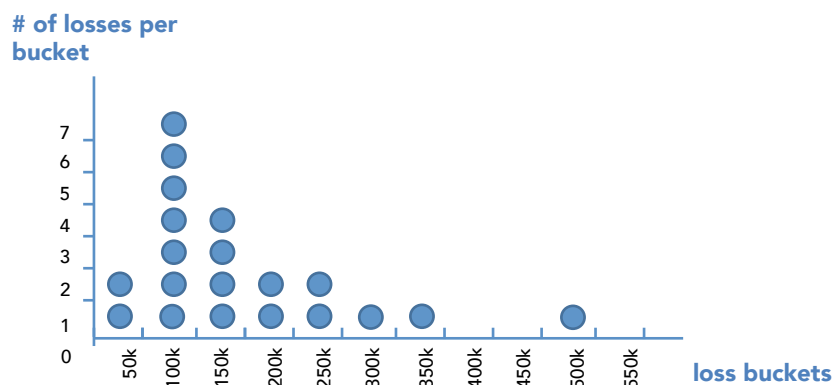


Case study 1: Mid-tier investment management firm

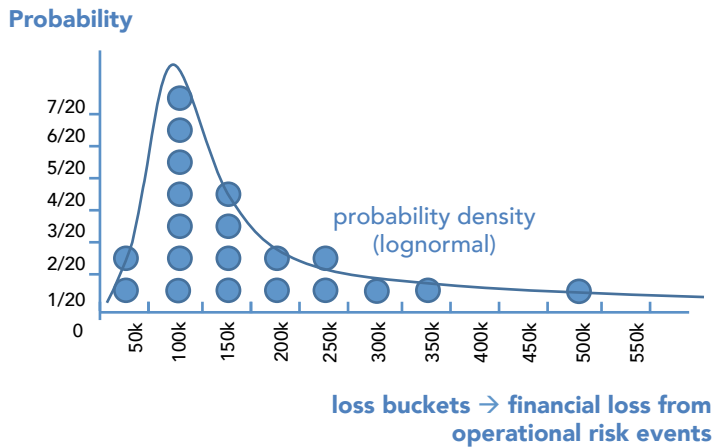
Results

- Improved focus on real risks: **tail events**
- Reduced operational risk **capital requirement**
- Linked risk to strategies in a way that matrices and risk registers cannot; **dynamic**
- Feeds in to the firm's **capital management** planning process
- Satisfies the **use test**

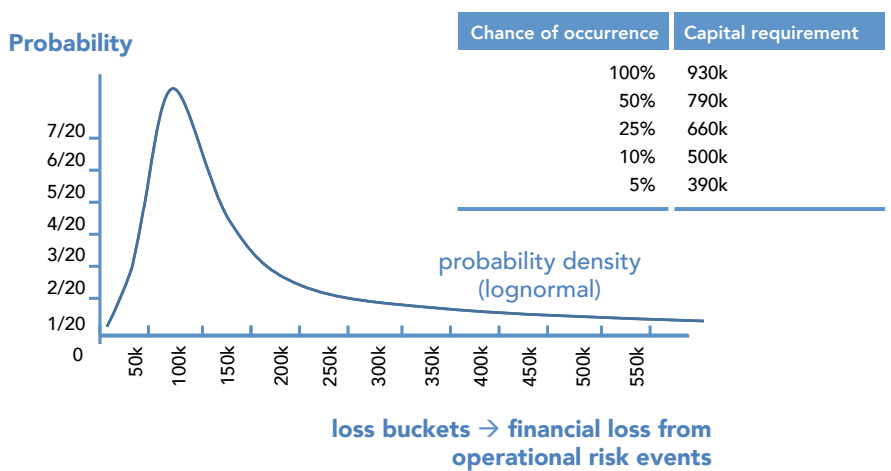
Problems with operational risk: operational losses → not normally distributed



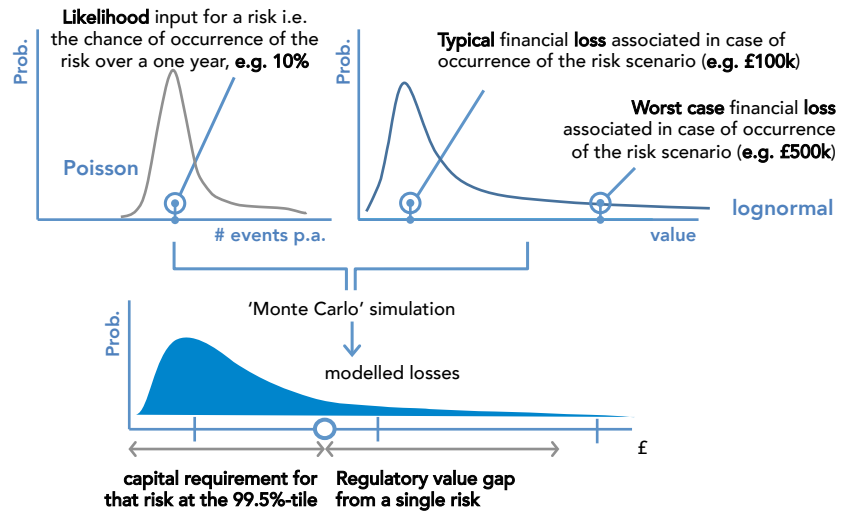
Operational risk is not normally distributed
 It can be approximated by a *lognormal* probability density



Operational risk is not normally distributed
 With lognormal distribution, what is the capital requirement at the 99.5% confidence level?

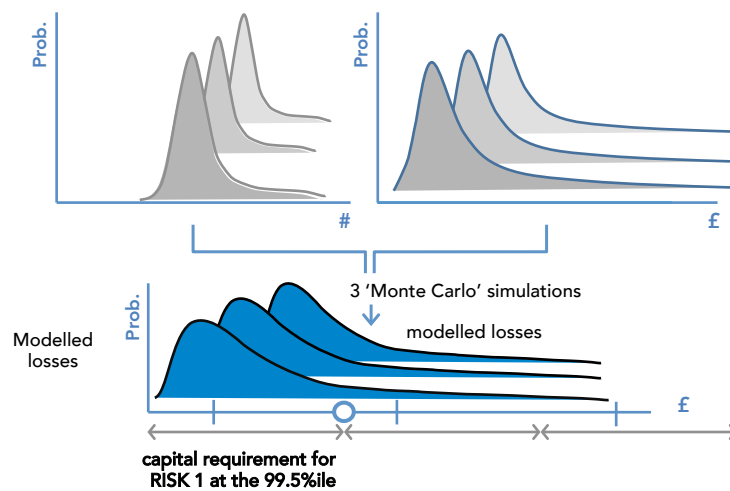


Insight 1: The chance-of-occurrence dimension



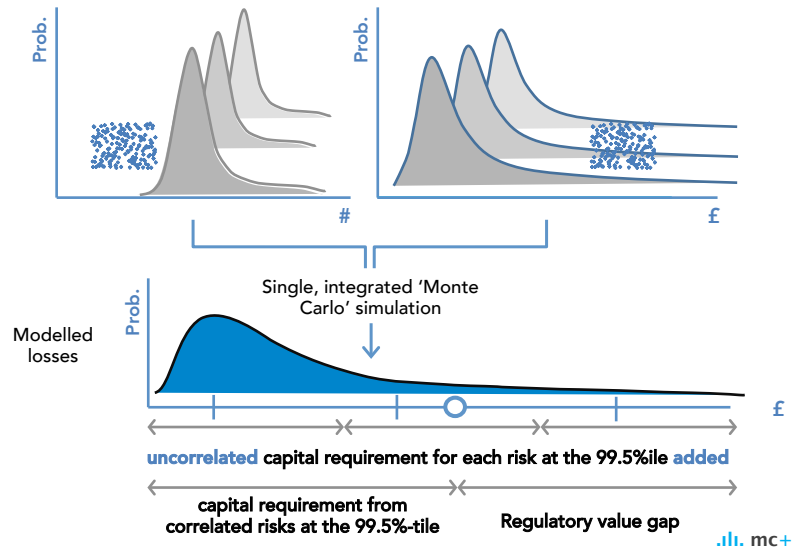
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Insight 2: Capital requirements are not additive . . .

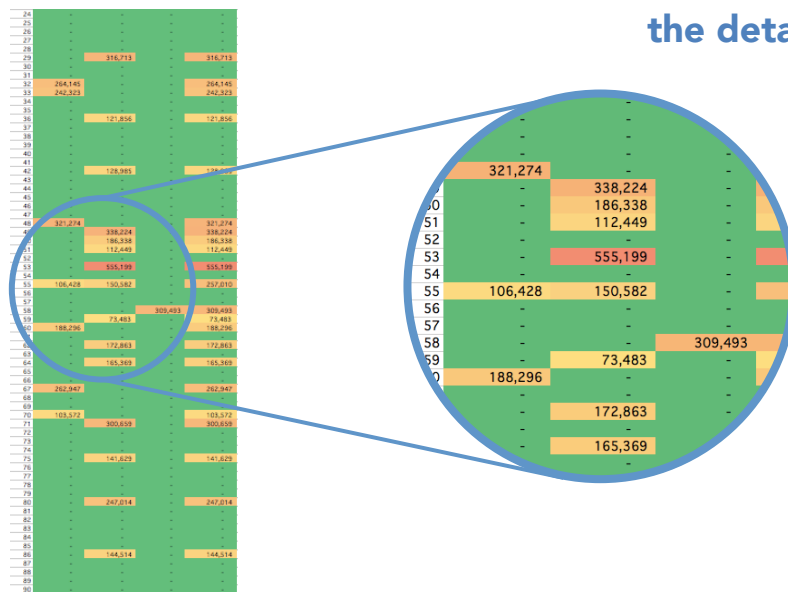


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Insight 2: . . . so correlations offer a diversification benefit



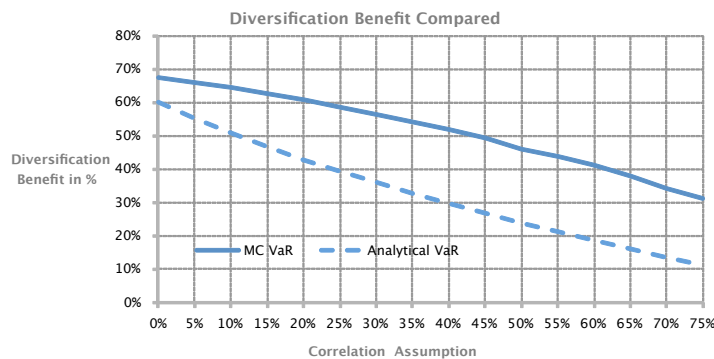
How simulation works: the details



Case study 2:
Another mid-tier investment management firm

- Receiving confusing messages about relationships between risks from major consultancies
 - Advised that diversification benefit could not exceed 40%
 - No evidence base given
- Advice didn't reflect the disparate nature of operational events and risks

Case study 2: What is the right diversification benefit for an investment management firm?

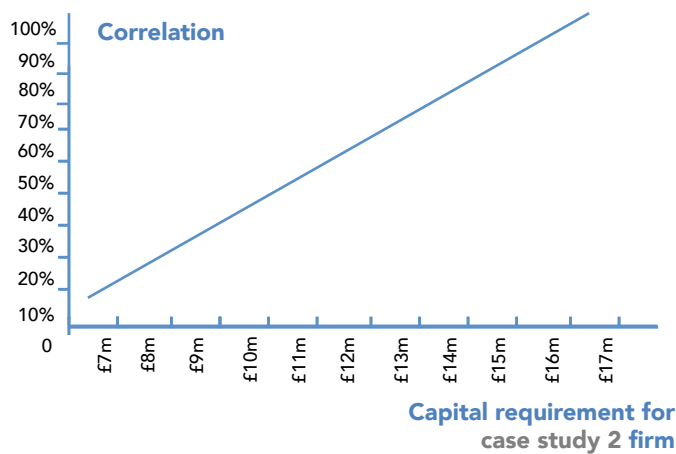


Case study 2: Correlation matrix example; let's make it simpler

	Risk 1	Risk 2	Risk 3	Risk 4	Risk 5
Risk 1	1				
Risk 2	L	1			
Risk 3	L	H	1		
Risk 4	L	M	M	1	
Risk 5	L	VH	H	M	1

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Insight 2: Capital requirements are not additive . . . so you leave money on the table by neglecting interactions



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Case study 2: Interactions between operational risks

Scenarios can **interact** (be correlated) with each other in different ways such as:-

- A **common** cause, for example:-
 - a sufficiently disruptive event could potentially affect a number of scenarios at the same time
- **Sequential** causes of another, for example:-
 - 'IT system failure' scenario increased likelihood of 'external fraud' scenario
- A **correlation matrix** can be used to examine possible interactions between scenarios

Case study 2: What is the right diversification benefit? Survey external sources. e.g. . . .

Figure 7.3: Average diversification benefit for each of the surveyed risks on a stand-alone basis, expressed as percentage of undiversified risk capital.



Case study 2:

Another mid-tier investment management firm

Results

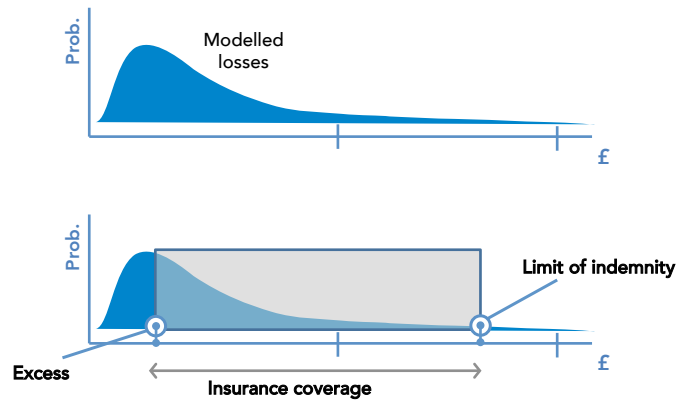
- Improved understanding of relationship between **probability** of occurrence and **loss**
- Increased understanding of **dependencies between risks** in operational risk scenarios
- No increase in analytic **load**
- Diversification resulted in reduced operational risk **capital required**

Case study 3:

Major investment management firm

- Passively renewing insurance for operational risks
- Wanted to understand whether premiums were justified given the profile of insured risks
- Identified range of scenarios within **cyber risk** loss type

Case study 3: Cyber risk modelling



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Case study 3: Major investment management firm

Results

- Negotiated **reduced insurance premium** based on scenario modelling
- Saved money
- Optimised excess and indemnity limit parameters
- Allowed the firm to emphasise **use of operational risk analysis** to its supervisor

Summary: operational risk is different

Use cases

- Reduction in operational **risk capital**:
 - Closing the regulatory value gap through simulated combination of risk scenarios
 - Enhanced understanding and use of interactions between risks
- Direct **savings**
 - More efficient and cost-effective transfer of operational risk
- Use in management **decision-making**
- Linking operational decision-making to **risk appetite**

Using the right tool

- Most operational risk activity increases analytical load and complexity
- Complexity is inherent in operational risk
- Complexity should be embedded in toolset not in the process of analysis of operational risk
- Risk analyses should be used for managerial decision-making
- Risk analysis must be rapid and dynamic

Questions . . .