



# Operational Risk

A practical approach

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# Life Operational Risk Working Party

## Terms of reference:

To develop a practical approach to assessing Operational Risk capital requirements for the ICA calculation

- Methodology
- Pitfalls
- A journey

# Why is this important?

## Risk actuaries

- Implement a pragmatic, reliable methodology to analyse and quantify risk exposure and tolerance
- Calculate the ICA in a short period of time
- Analytical review of control environment
- Combines qualitative and quantitative assessments

## Senior management

- Provides insight on where and why OR capital is needed
- Ensure a robust exhaustive framework to deal with operational loss events
- Feedback on the quality of the management by highlighting areas of concern not well controlled
- Ultimately provides evidence for reducing capital requirements

# Why is this important?

## Advisors

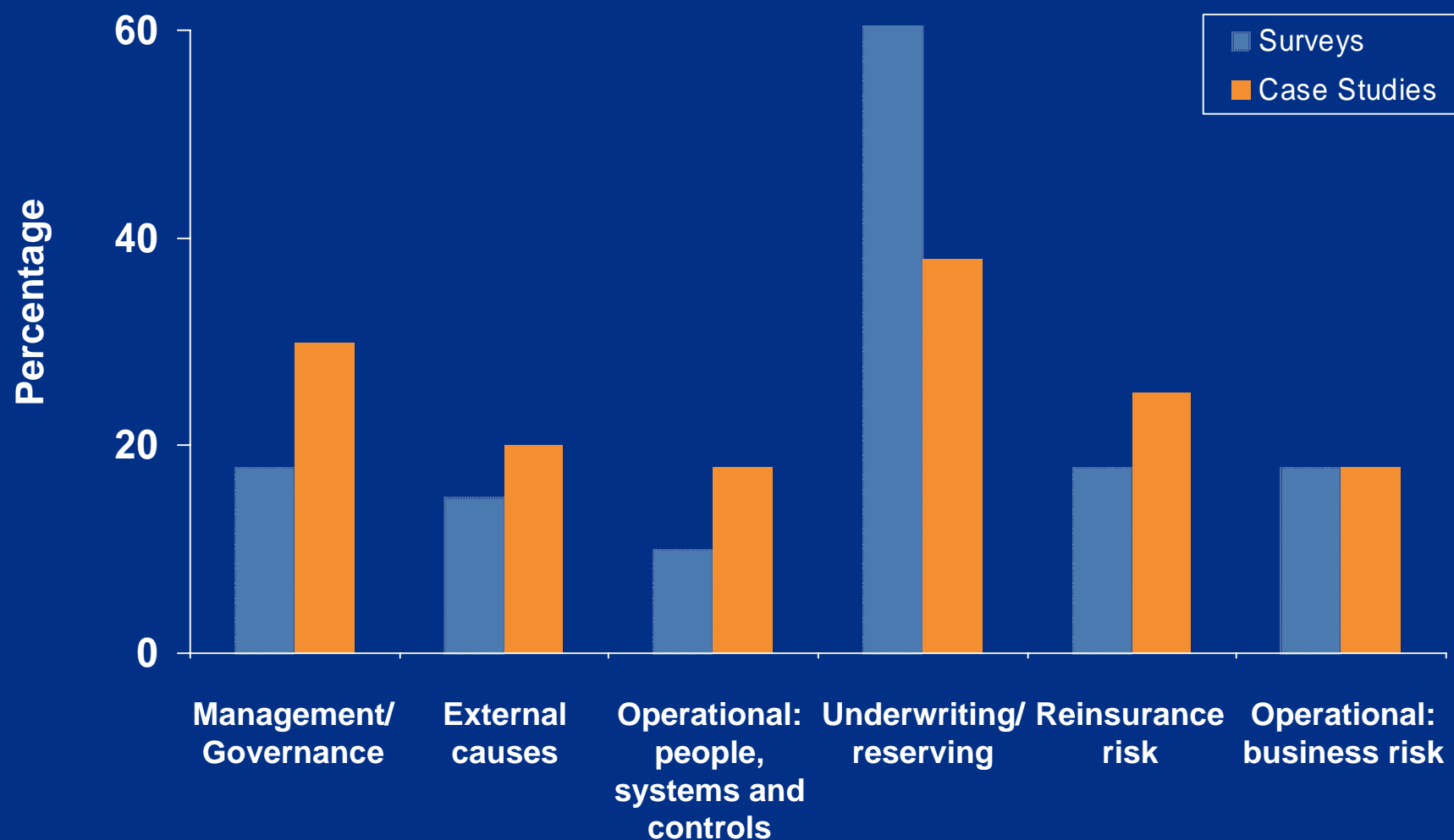
- A journey for your clients
- Assisting with spreading best practice
- Opportunity to bring in experience from other sectors / countries

# What needs to be done for ICA?

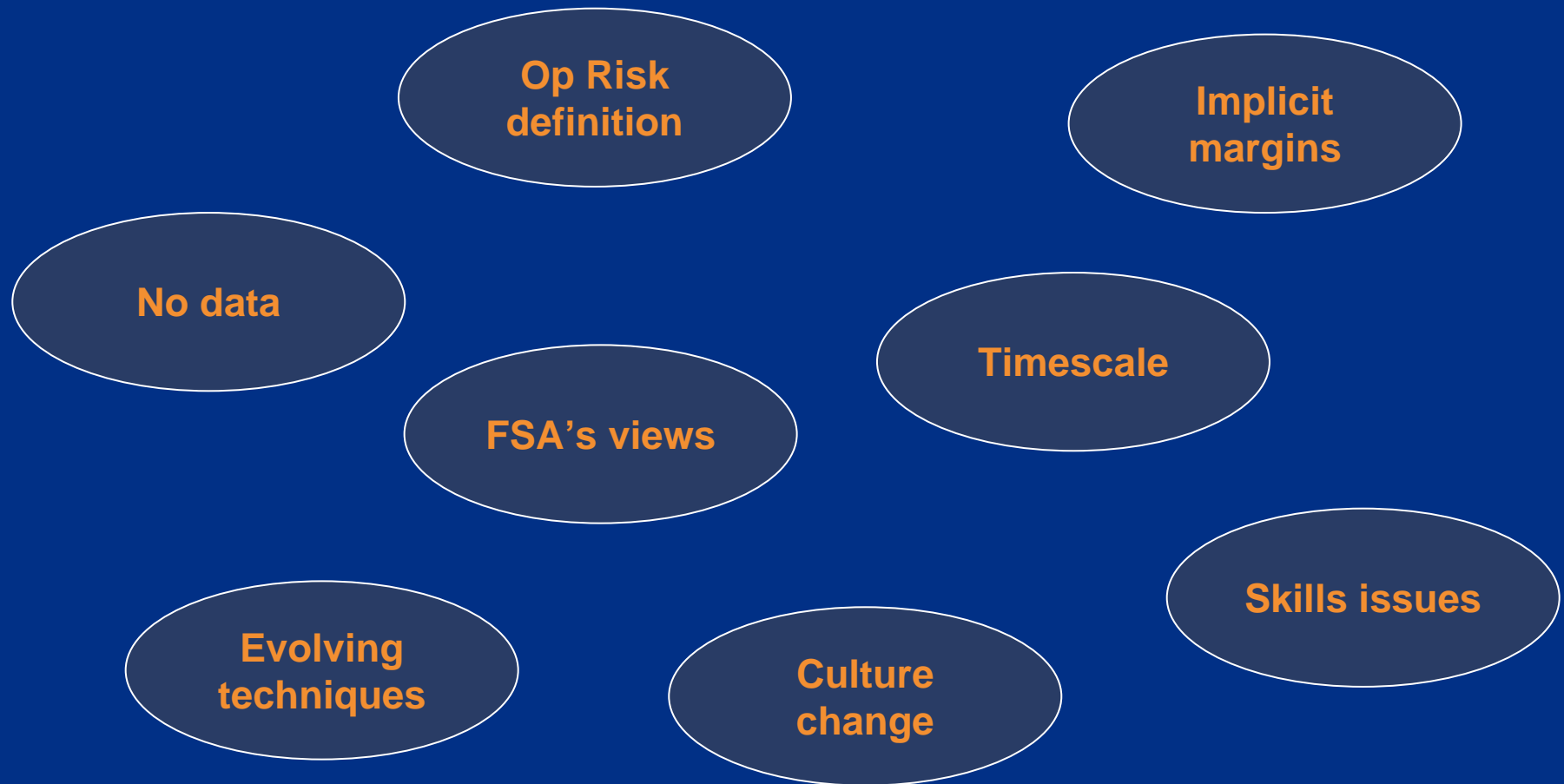


Assessment requirements	Evidence to support assessment
● Risk identification	● Business plan and risk map
● Prioritisation	● Rationale, Board agreement and sign-off
● Risk/probability/input analysis	● Board agreement and sign-off
● Risk assessment	● Approach and methodologies
● Risk quantification and aggregation	● Risk and capital calculation ● Stress testing and scenario analysis

# FSA OP20 – Practical lessons from recent ‘failures’ of EU insurers



# The challenges



# Principal steps

1. For which operational risks is it necessary to hold capital, and what data is available?
2. Risk assessment
3. Modelling techniques/approaches
4. Scenarios and external events
5. Aggregating the results
6. Presentation of the results
7. Using the Operational Risk and capital assessment in the business



# Can some scenarios /risks be ignored?

**Where covered by other risk categories**

**Where holding capital is an inappropriate mitigant**

- Risks transferred
- Risks controlled
- Non-monetary risks

# Available data?

## Internal data

- Compensation
- Ex gratia
- Expense overruns

## Risk reports

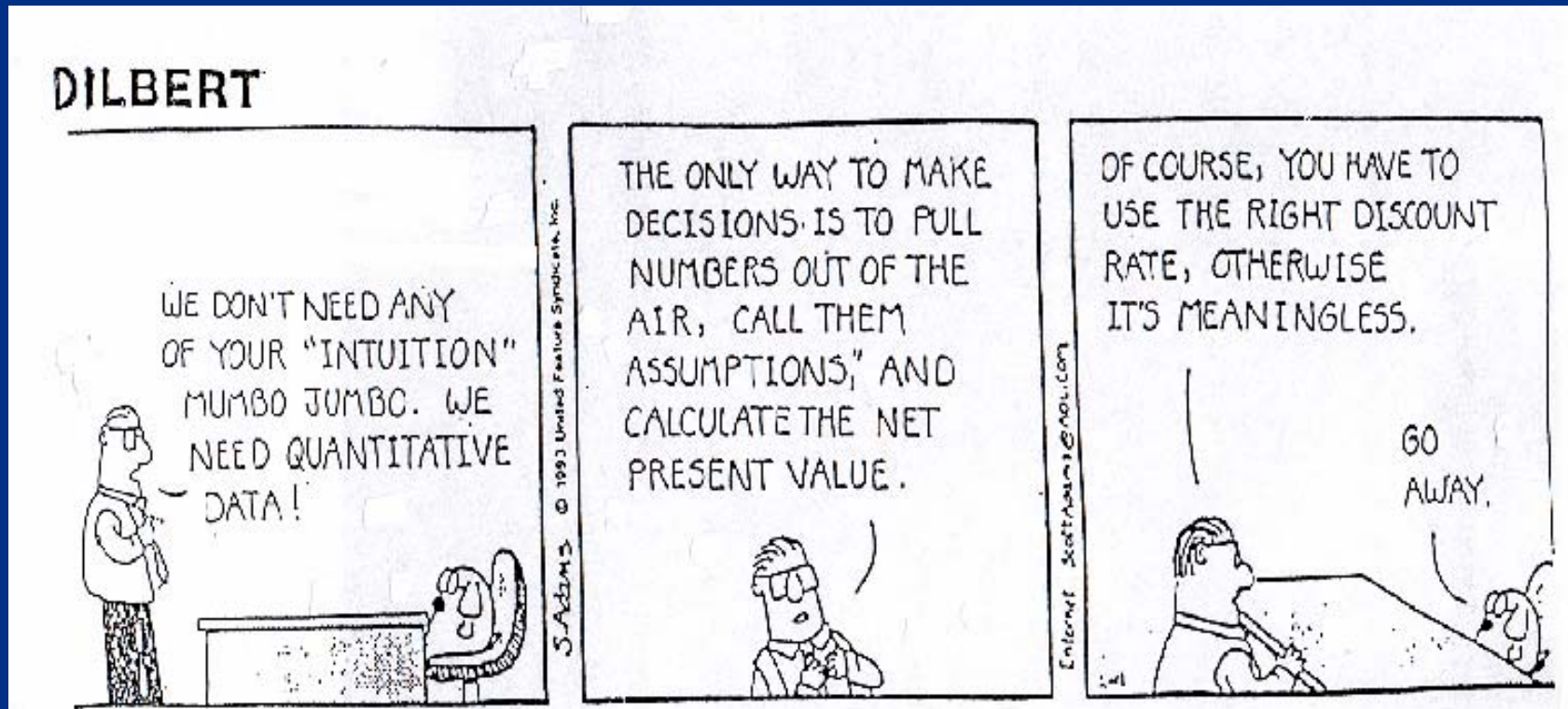
- Internal Audit reports
- Risk management reports
- External Audit reports



## Experienced operational managers

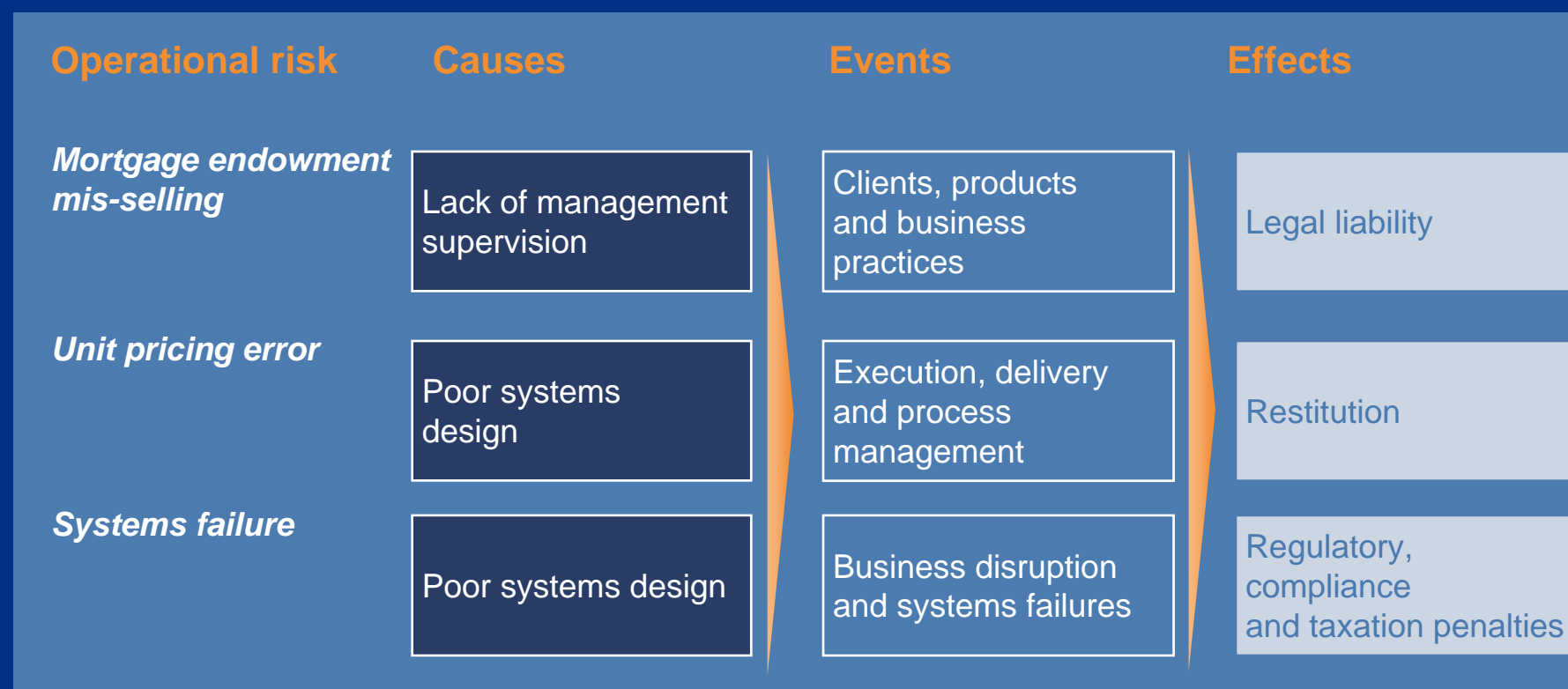
## External loss data

# What data?



# Mapping causes to events to effect

## Example root cause analysis



# Risk assessment

## Key features

- Consistent method for evaluating and reporting risks and controls pre and post control
- Improves risk transparency and promotes common understanding of risks and controls
- Forces people to think about the potential downside associated with their activities
- Focuses attention on the existing measures through risk assessment both before and after control

## Inputs

- Previous data collection and experience
- Risk assessment criteria
- Risk categorisation model
- Thresholds for acceptable levels of risk

Identify, categorise and assess risks

Identify key controls and effectiveness

Reassess key risks after controls

Identify risk owners and MIS requirements

Identify and address control weaknesses

## Outputs

- Risk and control 'profiles'
- Assigned risk 'owners'
- Action plans for improvements
- Qualitative risk management data
- MIS inputs via KRIs

# Overview of quantification techniques

Scenario analysis	Loss distribution approach	Scorecards
<ul style="list-style-type: none"> <li>• Draws on the knowledge of experienced business managers and risk management experts to derive assessment of plausible (severe) losses</li> <li>• Scenarios variables are 'stressed' to see how they would fluctuate</li> </ul>	<ul style="list-style-type: none"> <li>• Estimate the probability distribution functions of the single event impact and the event frequency for the next (one) year using internal data.</li> <li>• Compute the probability distribution function of the cumulative operational loss</li> </ul>	<ul style="list-style-type: none"> <li>• Converts the qualitative scorings of risk (frequency and impact) into quantitative amounts by assigning parameters and sanitisation to the scorings</li> </ul>
<p><b>Key issue</b> Lack of internal and external data</p> <p>Unexpected loss: Scenario testing only carried out to test exposure to unexpected loss</p>	<p><b>Key issue</b> Lack/misclassification of data: OpRisk loss data may not be available.</p> <p>Risk impacts elsewhere may have been due to an operational risk causes</p>	<p><b>Key issue</b> Calibrating the factors appropriately for the risk categories – and the difficulty of justifying them</p>

# Advanced Measurement Approach

Approach	Basic Indicator Approach	Standardized Approach	Advanced Measurement Approaches (AMA)
<b>Calculation of Capital Charge</b>	<ul style="list-style-type: none"> <li>• Average of gross income over three years as indicator</li> <li>• Capital charge 15 percent of that indicator</li> </ul>	<ul style="list-style-type: none"> <li>• Average gross income over three years per regulatory business line</li> <li>• Depending on business line, 12 percent, 15 percent, or 18 percent of that indicator as capital charge</li> <li>• Total capital charge equals sum of charge per business line</li> </ul>	<ul style="list-style-type: none"> <li>• Capital charge equals internally generated measure based on: <ul style="list-style-type: none"> <li>– Internal and external loss data</li> <li>– Scenario analysis</li> <li>– Business environment and internal control factors</li> </ul> </li> <li>• Recognition of risk mitigation (up to 20 percent possible)</li> </ul>
<b>Qualifying Criteria Compliance with the Basel Committee's 'Sound Practices for the Management and Supervision of Operational Risk'</b>	<ul style="list-style-type: none"> <li>• No specific criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Active involvement of board of directors and senior management</li> <li>• Existence and independence of OpRisk management function</li> <li>• Sound OpRisk management system</li> <li>• Systematic tracking of loss data</li> </ul>	<p>Same as Standardized, plus:</p> <ul style="list-style-type: none"> <li>• Measurement integrated in day-to-day risk management</li> <li>• Review of processes by internal/external audit</li> <li>• Numerous quantitative standards – inc 3-5 years of loss data</li> </ul>



# Using questionnaires

- Likelihood of loss events occurring -
  - Likely, Probable, Possible, Unlikely
- Distribution of the loss amount given the event occurs
- Consider the loss if
  - a) controls work as expected,
  - b) controls happen to work well
  - c) controls fail to work as expected
- Review and challenge of estimates



# Statistical Distributions

## Incidence of Risk Event

### Poisson

- For a small time interval, the probability of the loss is approximately proportional to the length of the interval
- For a small time interval, the probability of more than one loss during that period tends to zero with the interval
- The numbers of losses in any two distinct intervals are independent

### Binomial

- Appropriate when the risk event can only happen once, for example, the failure of a specific supplier

**Parameters based on advice from experts in each business area**

# Statistical Distributions

## Loss Amounts

### Lognormal

- Only takes positive values only
- Skewed positively (more low-cost than high-cost)
- Allows generously for outliers

Parameters based on advice from experts in each business area

# Quantifying operational risk

The loss is generated stochastically by simulating the number of incidences and the loss amounts for each risk.

For each simulation:

Model the number of incidences for each risk and the total loss for each risk

Total loss for each simulation is the sum of losses over all risks

Simulation	Risk 1		Risk 2		.....	Risk n		All Risks
	Events	Loss	Events	Loss		Events	Loss	Total Loss
1	1	5.4	0	0	.....	1	2.7	67
2	0	0	2	43.9	.....	1	4.1	100
3	0	0	0	0	.....	0	0	0
.	.	.	.	.	.....	.	.	.
.	.	.	.	.	.....	.	.	.
.	.	.	.	.	.....	.	.	.
.	.	.	.	.	.....	.	.	.
20,000	1	8.2	1	30.4	.....	0	0	80

Simulate many times

For 20,000 simulations, the 99.5<sup>th</sup> percentile worst loss is the 101<sup>th</sup> largest (0.5% are higher than this)

# Assessment Matrix

Risk Event	Included/ Excluded	Reason for inclusion	Probability of Occurrence	Loss Amount			Additional Action Plan
				Optimistic	Expected	Pessimistic	
Internal Fraud	Included	Outwith appetite	1 in 50	250K	500K	1m	Review insurance cover
Failure to model properly	Included	New processes	1 in 15	20m	40m	60m	Systems and controls review now underway
Treasury Settlement Error	Included	Low likelihood controls in place	1 in 100	1K	25K	50m	
Geopolitical risk arising from o/s in India	Included	Supplier has an SLA	1 in 20	2m	5m	10m	

# Correlations

	Process	Systems	Mis-selling	Other
People	25%	10%	25%	25%
Process		10%	10%	10%
Systems			5%	0%
Mis-selling				0%
Other				

# Typical results

- Around 50% of undiversified OR capital relates to misselling issues
- Diversified capital is about 75% of undiversified
- OR capital is typically 10% to 20% of total ICA
- OR capital is in range of 1% to 2% of Pillar 2 assets

# Output

## The output from the OR process will include:

- Assessment of OR capital requirement

And possibly input to:

- Basis for a loss (or near miss) database
- Analysis of the drivers/causes of losses
- Identification of the controls over OR, and their weaknesses
- Assessment of the potential impact of control failures
- Identification and consideration of the impact of scenarios which could significantly impact the company

# Issues to be considered

## Board

- How to communicate results to the Board?
- Are the Board fully aware of the business impacts?
- Is there visible management buy-in/consensus throughout the organisation?
- Has the project been incorporated into business planning and budgeting?

## Risks

- Have the risks categories and their potential impacts been identified and fully understood?
- Has sufficient time been allowed to meet these requirements?
- Has the interaction between risk categories been understood and dealt with?

## Data

- Have likely data sources been identified?
- Have future data requirements been defined?
- How can correlations be tested and measured?



# Issues to be considered

## Resources

- Are there adequate resources to meet the required deadline?
- Do the resources available have the necessary skills and expertise?
- Is there an appropriate training programme tailored for all levels across the organisation?

## Organisation

- Is there a strategy in place to communicate the implications and any related process changes?
- Does the reporting structure support implementation and the required changes?
- Is the impact on performance management and measurement understood?

## Regulator

- What are the views of the regulator on process and results?

# Operational risk management framework



# Strategic objectives

## The strategic objectives need to adhere to specific requirements in relation to operational risk

- The business strategy needs to be clearly articulated and understood
- The operational risk management function's strategy needs to be clearly articulated and understood
- Both these strategies need to be complementary of each other

Key features of policy	An example of a risk policy may include:
● Senior management commitment and sign-off	● Mission statement
● Documented in the form of a risk policy	● Definitions
● Risk policy document 'owned' and updated by the risk manager, approved by the Board	● Guiding principles
● Senior management commitment and sign-off	● Business case
● Documented in the form of a risk policy	● Organisational structure

# Management information

## Key features

- Reporting requirements, thresholds, escalation and updating procedures
- Management information tailored to reflect entity level of sophistication
- Risk reporting process established across the organisation up to Board level

**“Top 10 risks” identification**



Ad hoc

**Basic management information not linked to risk assessment or definition**



Moderately developed

**Simple KRIs used across organisation**



Advanced

**Some integration into KRIs, loss data, quantitative measures**



Best practice

**Fully integrated methodologies and reporting**



Thought leader

# People and Rewards

**Evaluation and coaching**

**Training and development**

**Type and mix of rewards**

**Criteria for receiving rewards**

**Promotion/advancement process**

# Key messages

A pragmatic approach, capable of ongoing refinement

A framework is needed to manage OR capital  
as techniques and standards evolve

A significant culture change is required