



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

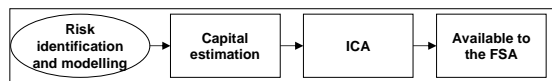
- Provides insight on where and why OR capital is needed
- Ensure a robust exhaustive framework to deal with operational loss events
- Feedback on the quality of the management by highlighting areas of concern not well controlled
- Ultimately provides evidence for reducing capital requirements

Why is this important?

Advisors

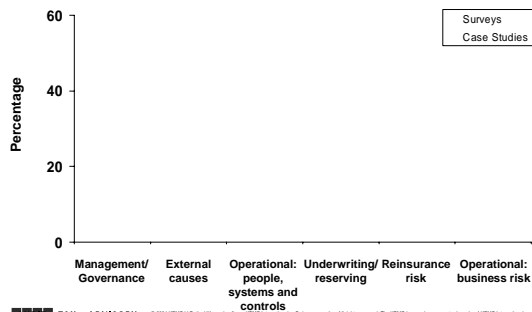
- A journey for your clients
- Assisting with spreading best practice
- Opportunity to bring in experience from other sectors / countries

What needs to be done for ICA?

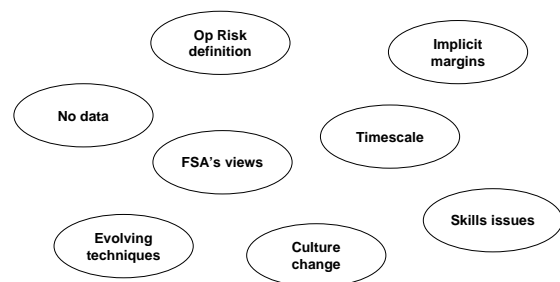


| Assessment requirements | Evidence to support assessment |
|---------------------------------------|--|
| • Risk identification | • Business plan and risk map |
| • Prioritisation | • Rationale, Board agreement and sign-off |
| • Risk/probability/input analysis | • Board agreement and sign-off |
| • 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



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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

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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

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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

| Operational risk | Causes | Events | Effects |
|---------------------------------------|--------------------------------|--|---|
| Mortgage endowment mis-selling | Lack of management supervision | Clients, products and business practices | Legal liability |
| Unit pricing error | Poor systems design | Execution, delivery and process management | Restitution |
| Systems failure | Poor systems design | Business disruption and systems failures | Regulatory, compliance and taxation penalties |

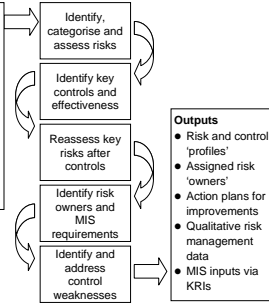
Risk assessment

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



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



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Overview of quantification techniques

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



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Advanced Measurement Approach

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



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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

Simulate many times

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



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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 property | 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 | |



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Correlations

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



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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

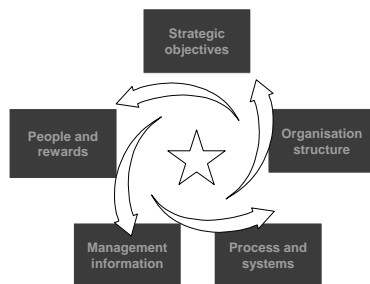
Issues to be considered

| | |
|--------------|---|
| Board | <ul style="list-style-type: none">• 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 | <ul style="list-style-type: none">• 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 | <ul style="list-style-type: none">• Have likely data sources been identified?• Have future data requirements been defined?• How can correlations be tested and measured? |

Issues to be considered

| | |
|---------------------|---|
| Resources | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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: |
|---|--|
| <ul style="list-style-type: none"> Senior management commitment and sign-off | <ul style="list-style-type: none"> Mission statement |
| <ul style="list-style-type: none"> Documented in the form of a risk policy | <ul style="list-style-type: none"> Definitions |
| <ul style="list-style-type: none"> Risk policy document 'owned' and updated by the risk manager, approved by the Board | <ul style="list-style-type: none"> Guiding principles |
| <ul style="list-style-type: none"> Senior management commitment and sign-off | <ul style="list-style-type: none"> Business case |
| <ul style="list-style-type: none"> Documented in the form of a risk policy | <ul style="list-style-type: none"> 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

Basic management information not linked to risk assessment or definition

Simple KRIs used across organisation

Some integration into KRIs, loss data, quantitative measures

Fully integrated methodologies and reporting

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
