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RAMP

Risk Analysis and Management for Projects

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Agenda

- How RAMP came about
- Purpose and scope of RAMP
- The RAMP process
- RAMP and financial services
- RAMP within ERM
- How actuaries can help RAMP users

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How RAMP came about

- Collaboration between actuaries and civil engineers since 1995
- RAMP first published 1998
- Growth of interest in RAMP
- Second edition, 2005

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Purpose and scope of RAMP

- A framework for managing project risk
- Applicable to any complex project
- Analyses risk in a financial context
- Facilitates an optimum response to risk
- Leads to better design and control of projects
- Improved decision-making

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A Country Walk

- Define objectives
- Identify risks
- Find the risk response options
- Decide which options to adopt
- Control residual risks

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RAMP Process

- The risks – identify, analyse, find response options
- Feed into a financial model, e.g. NPV
- Use scenario analysis or stochastic modelling
- Determine responses leading to risk efficiency
- Identify residual risks and make decision
- Implement responses and control residual risks

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Aspects of RAMP

- A logical iterative process
- Ensures steps not omitted (e.g. assumptions list)
- Facilitates a watch on the risk tails
- Not in itself mathematical
- Not a substitute for judgement

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Example (1)

<u>Year</u>	<u>Expected cashflow £000s</u>
1	- 1,000
2	+ 300
3	+ 400
4	+ 400
5	+ 400
Total	+ 500
NPV (6%)	+ 292

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Example (2)

<u>Scenario</u>	<u>Risk event</u>	<u>Probability</u>	<u>NPV</u>
		%	£000
A	Expected	55	+ 292
B	Sell know-how	10	+481
C	Technical delay	15	- 64
D	Does not work well	10	- 54
E	C and D together	10	-391
		100	+155 *

* weighted average

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Example (3)

Risk Response option: contractor offers to bear extra development costs (if there is technical delay as in scenarios C and E) for an extra £80,000. Should the sponsor accept?

Example (4)

Scenario	Probability	Original NPV	New NPV
	%	£000	£000
A	55	+292	+212
B	10	+481	+401
C	15	- 64	+139
D	10	- 54	-134
E	<u>10</u>	<u>-391</u>	<u>-188</u>
	100	+155 *	+145*

* weighted average

The nature of risk

- Uncertainty
- Fuzziness
- Dependence
- Upside/downside

Identification of risks

- Brainstorming
- Ascertain underlying causes
- Risk register records detail of each risk and possible impact
- Checklists, site visits, review of plans
- Upside risks, too

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Analysis of risks

- Likelihood/frequency
- Impact(s)
- Risk assessment tables
- Catastrophic risks
- Use of an investment model to assess NPV distribution

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Risk responses – downside risks

- Reduce/eliminate
- Transfer
- Avoid
- Absorb or pool
- Research to reduce uncertainty

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Risk responses – upside risks

- Increase scope
- Improve design
- Maximise revenues
- Reduce costs
- Extend life
- Transfer

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Risk efficiency

- A state achieved when the downside risks have been sufficiently mitigated and the upside risks optimised (depending on sponsor's utility)
- Trial and error needed
- Search for “cheap” response options
- Deal with some risks simultaneously?
- Secondary risks

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Bias

- Accidental bias
- Deliberate bias
- Adjustment for optimism bias – government increases estimated cost but would full risk analysis be better?

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Decision

- Identify residual risks and NPV distribution
- Watch the tails
- Intangible factors
- Decision criteria

Planning for risk control

- Risk response plan
- Risk custodians
- Contingency plans and budgets
- Crisis management
- Communicate

Controlling risks

- Study trends (potential, expected, committed)
- Meet interested parties regularly
- Formal risk reviews
- Reassessments
- RAMP close down

Financial Services Organisations

Applications of RAMP:

- Project finance
- New products
- Computer systems
- Takeovers
- Property developments
- Major change initiatives

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RAMP within an ERM approach

- Enterprise risk = Strategic risk +
Project risk +
Operational risk
- Knitting it all together
- Forecasting operational risks on projects
- Strategic risk of wrong projects
- When do project risks become strategic?

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How Actuaries can help RAMP users

- Building investment models and choosing discount rates
- Scenario analysis and stochastic modelling
- Achieving risk efficiency
- Insurance-based risk-mitigation
- Decision criteria (including real options and shareholder value)
- Project financing

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Some broader issues

- Experience of infrastructure projects
- Use of social benefit analysis
- Engineers against poverty
- Cost of using RAMP

Conclusion

- RAMP is now well established
- Capable of wider application, e.g. in financial services
- Potential for actuarial involvement
- Future development of RAMP
- Website: www.RAMPrisk.com
