

Risk and Capital Investment Projects

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The Issues

- Looking at it from a total project perspective...

- What is a project?
- What is risk?
- How does risk fit in?
- Who pays?
- How much?
- How does risk fit in?

What is a Project?

The Environment

Political

Legal

Economic / Commercial

Environmental

The Components

Construction

Operation

Revenue

Finance

What is Risk?

- For there to be a risk there has to be:
 - A project
 - A hazard that is known to exist
 - An assessment of the likelihood that the hazard will happen
 - Knowledge of the likely impact of the hazard on the project

What is Risk?

- Risk and outcome are often misunderstood
 - Outcome describes the impact, eg
 - delay
 - cost blowout
 - poor quality
 - The risk describes the event, eg
 - failure to grant right of way
 - poor ground conditions
 - material defect

What is Risk?

- Risk and Uncertainty are often misunderstood
- Risk can be:
 - Identified - they are known to exist
 - Analysed - by which we usually mean quantified in some meaningful way
 - Managed – action taken to remove, reduce, mitigate, allocate or ignore
- Uncertainty can't be known or predicted

What is Risk?

- Project Risks
- Market Risks
- What about Uncertainty ?

“Consider, for example, the September 11 attacks. The statistical basis for assigning a probability distribution to its occurrence did not exist in any real sense”

What is Risk?

Market Risks

Political

Legal

Economic /
Commercial

Environmental

Project Risks

Construction

Operation

Revenue

Finance

“The risks and uncertainties that might impact on a project are completely independent of the means of procurement and finance”

How does risk fit in?

Focus on Risk Management

Value for Money -
Risk Allocation



Risk Mitigation



Bid Evaluation -
Investment Appraisal



Risk Reduction

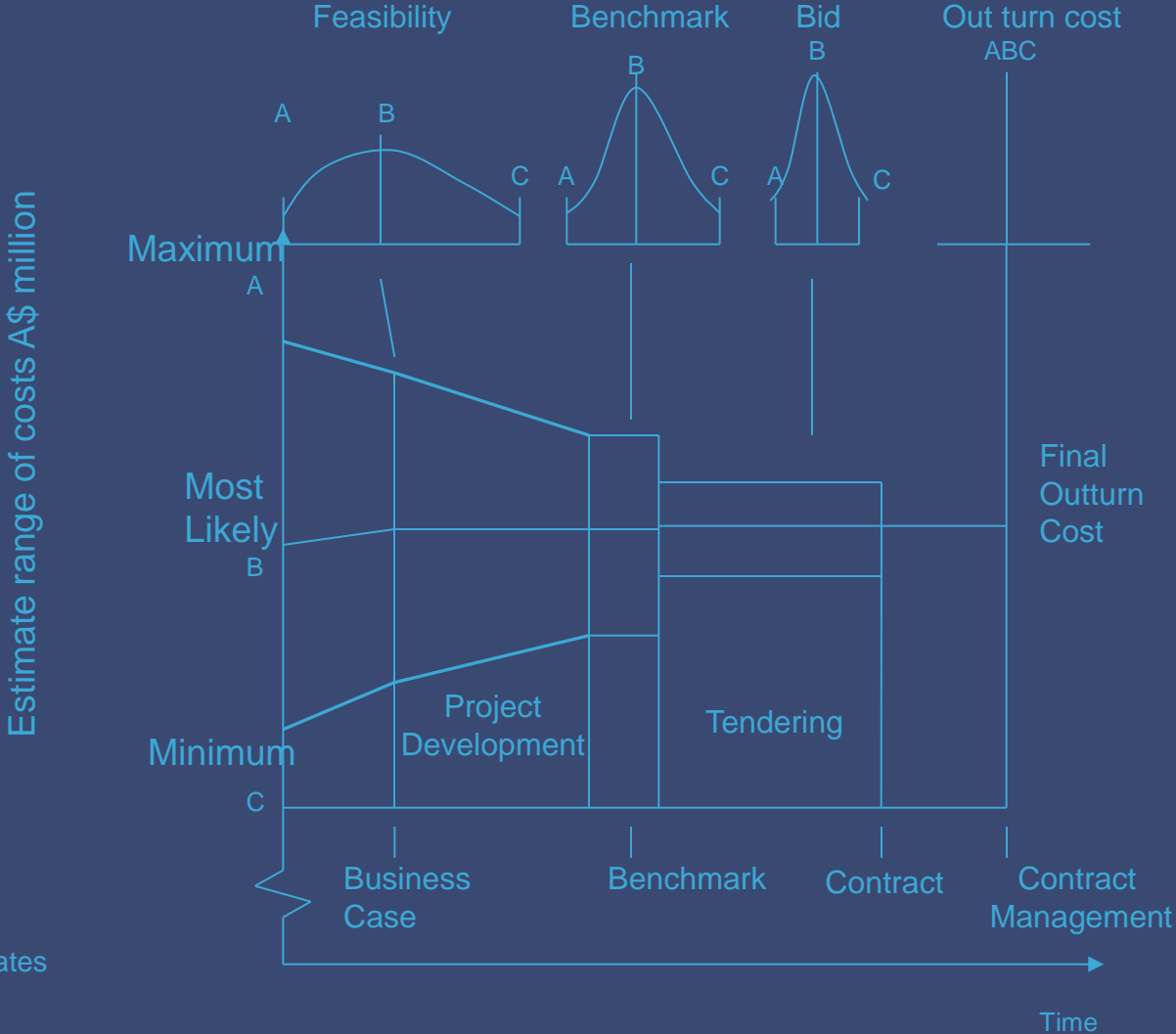


Risk Prevention



How does risk fit in?

Torpedo Diagram of Risk Management



Who Pays?

- You do....
 - Risk needs just two things
 - An Environment
 - A Project
 - Overall risks remain unchanged unless
 - Removed
 - Reduced
 - Created

Who Pays?

- Risk is unaffected by finance
 - Ever heard of CAPM?
- Risks do not disappear when transferred
 - Risks are only mitigated to the extent of:
 - A company's ability to control risks (management quality)
 - A company's ability to accept risks (credit quality)
 - Your ability to rely on them (contract quality)

How much?

- In theory:
 - In Australian PPP projects circa 8% of NPV
 - In UK PFI projects circa 12% of NPV
- In practice it's a different story:
 - Pickrell 1990
 - Fouracre et al 1990
 - Flyvberg et al 2002 study
 - Mott MacDonald 2002 study

“Evidence has come to hand on the extent of cost overruns and revenue shortfalls on infrastructure investment – Appraisal Optimism!”

How much?

Flyvberg Study – Average cost escalation

- Rail 45%
- Fixed – Link 34%
- Road 30%
- All Projects 39%

“Flyvberg looked at over 258 large infrastructure projects covering 20 countries, the overwhelming majority of which were developed using conventional approaches”

How much?

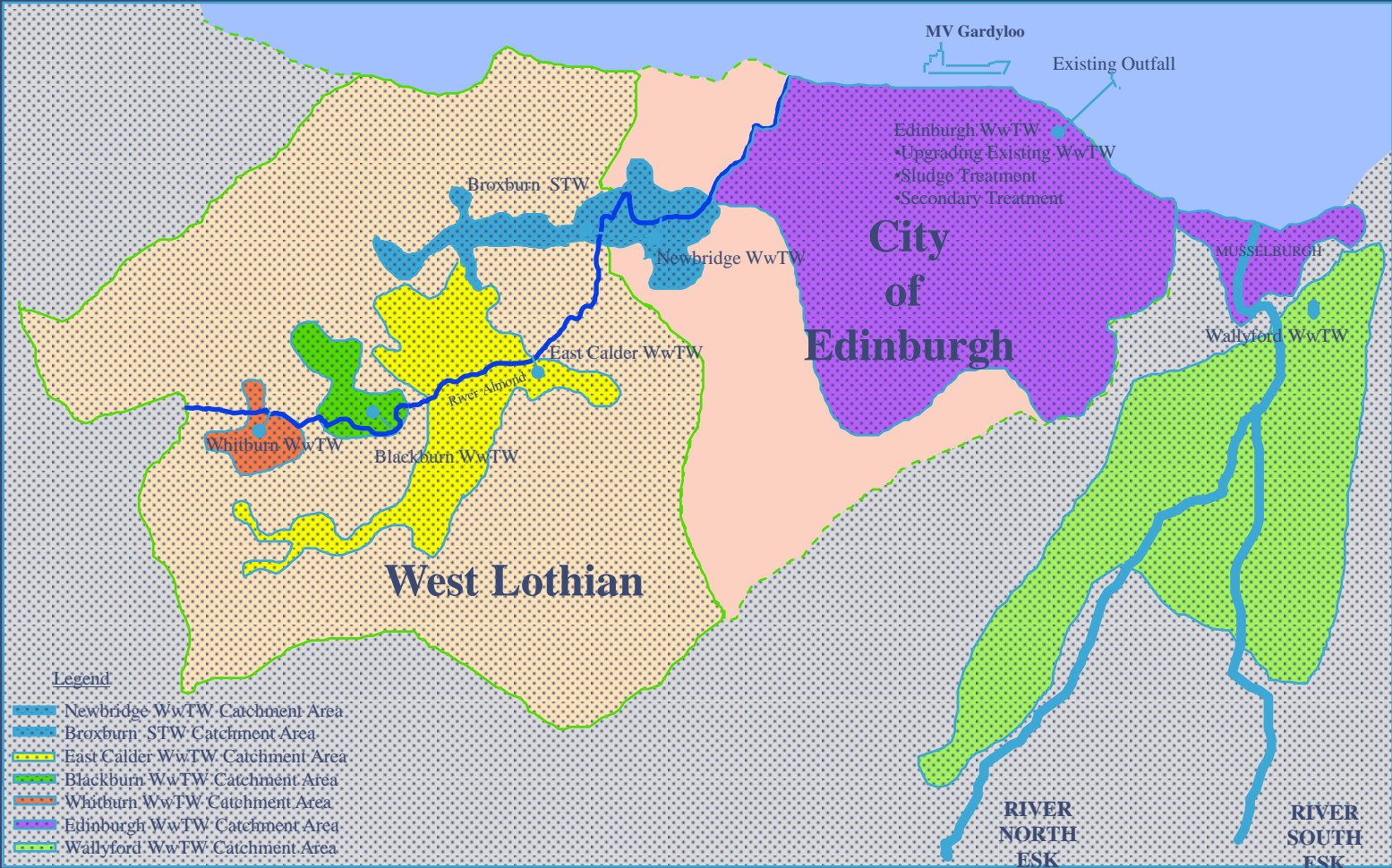
Mott MacDonald Study – Average “Optimism Bias”

- Standard Civil 44%
- Non Standard Civil 66%
- Standard Buildings 24%
- Non Standard Buildings 51%
- Equipment Development 214%
- Outsourcing (OPEX) 41%
- All Projects 47%

“Mott MacDonald reviewed the outcome of 50 large public procurement projects in the UK over the last 20 years”

How much? Case Study

The Almond Valley & Seafield Project



How much? Case Study

The Almond Valley & Seafield Project



- Waste Water Treatment Services over 30 years
- £99 million of Capital Investment
 - £80 million Wrapped Bonds
 - £15 million Subordinated Debt
 - £5 million Equity



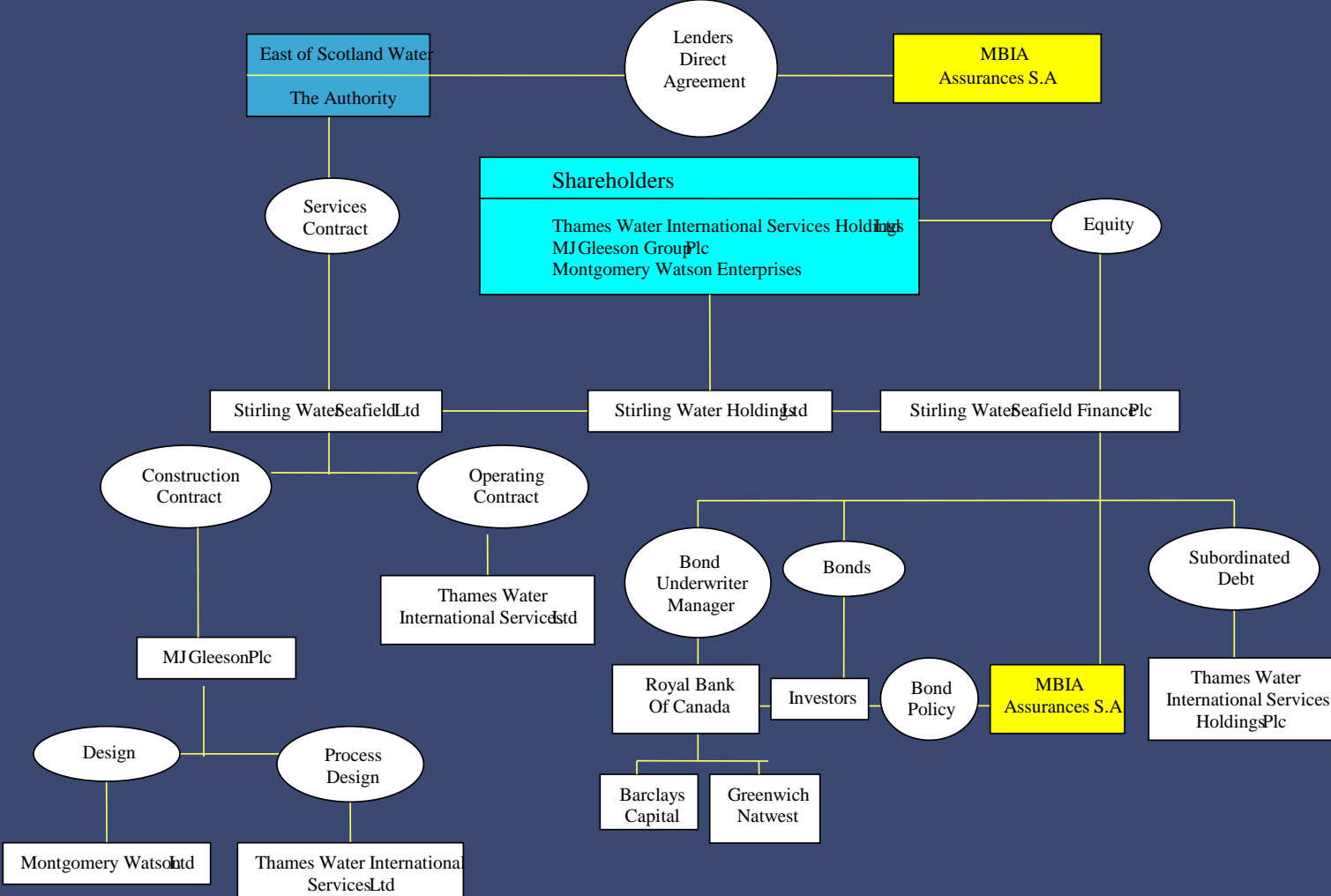
How much? Case Study

The Almond Valley & Seafield Project - Key Players

- East of Scotland Water - The Procurer
- Stirling Water - the Special Purpose Vehicle
- Thames Water - Sponsor, Operator, Process Design and provider of Subordinated Debt
- MJ Gleeson - Sponsor and Construction Contractor
- Montgomery Watson - Sponsor and Design
- MBIA - Credit Enhancement Insurance Policy, the “Lender”

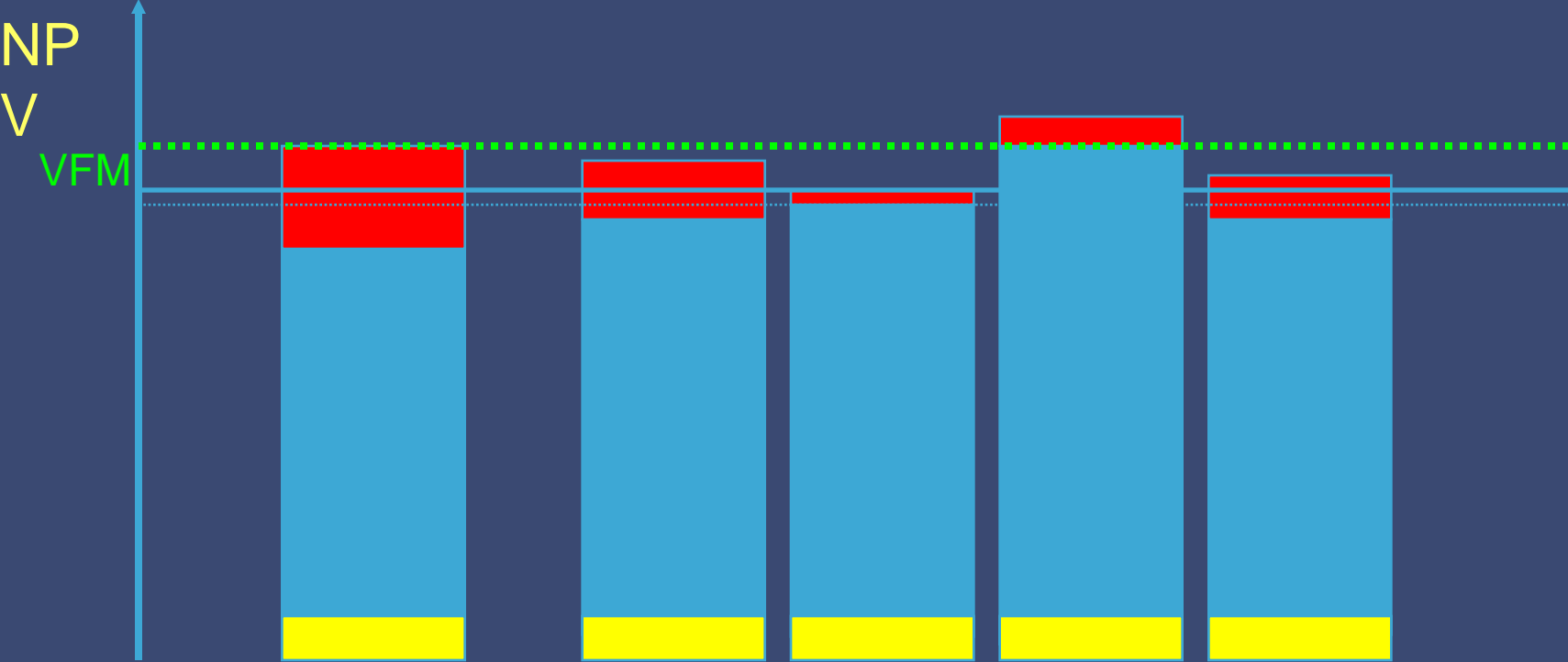
How much? Case Study




The Almond Valley & Seafeld Project - Contractual Arrangements



How much? Case Study

- Value for Money Evaluation



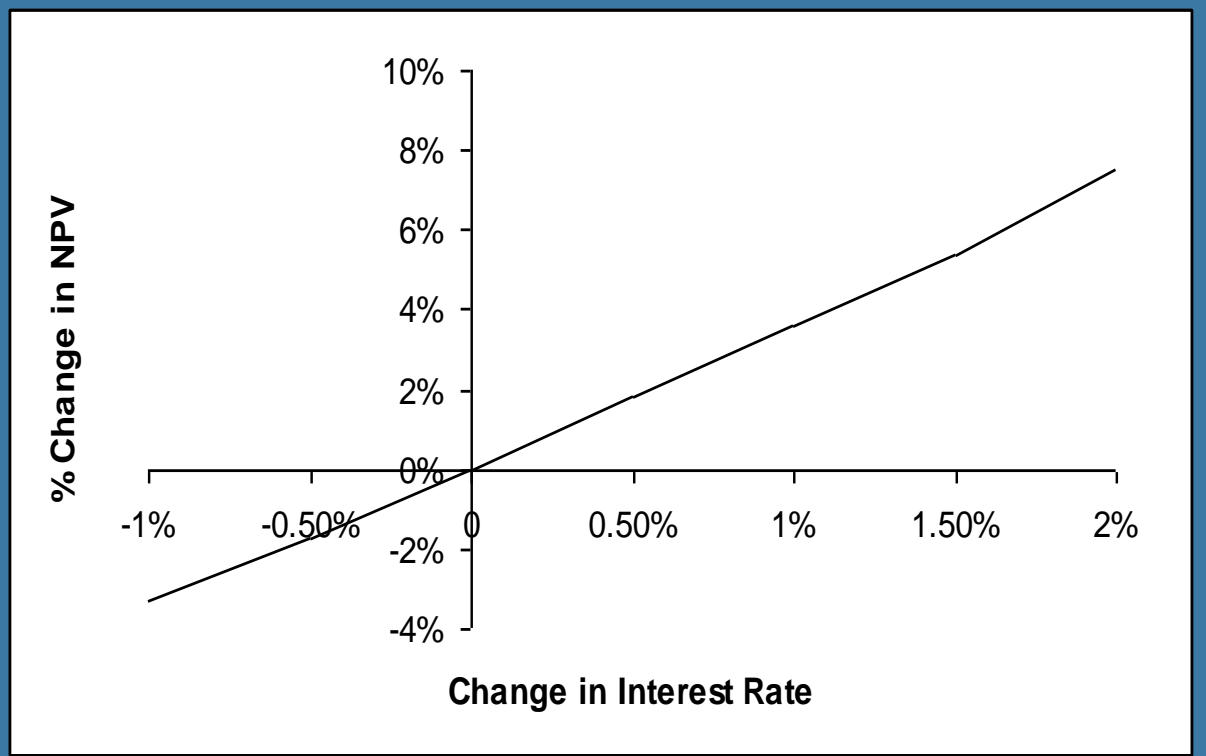
-  Risk Adjustment (PSC) / Adjustment for CP risk, qualifications and delay (Bids)
-  NPV of base costs (PSC) / NPV of payments (Bids)
-  Base o'head costs (similar for both PSC & Bids - not quantified for evaluation)

How much? Case Study

- AVS Project Risk Analysis - The Procurer
 - Value for Money Evaluation
 - Conditions Precedent to Financial Close
 - Qualifications
 - Delay to Financial Close
 - Macroeconomic Risks

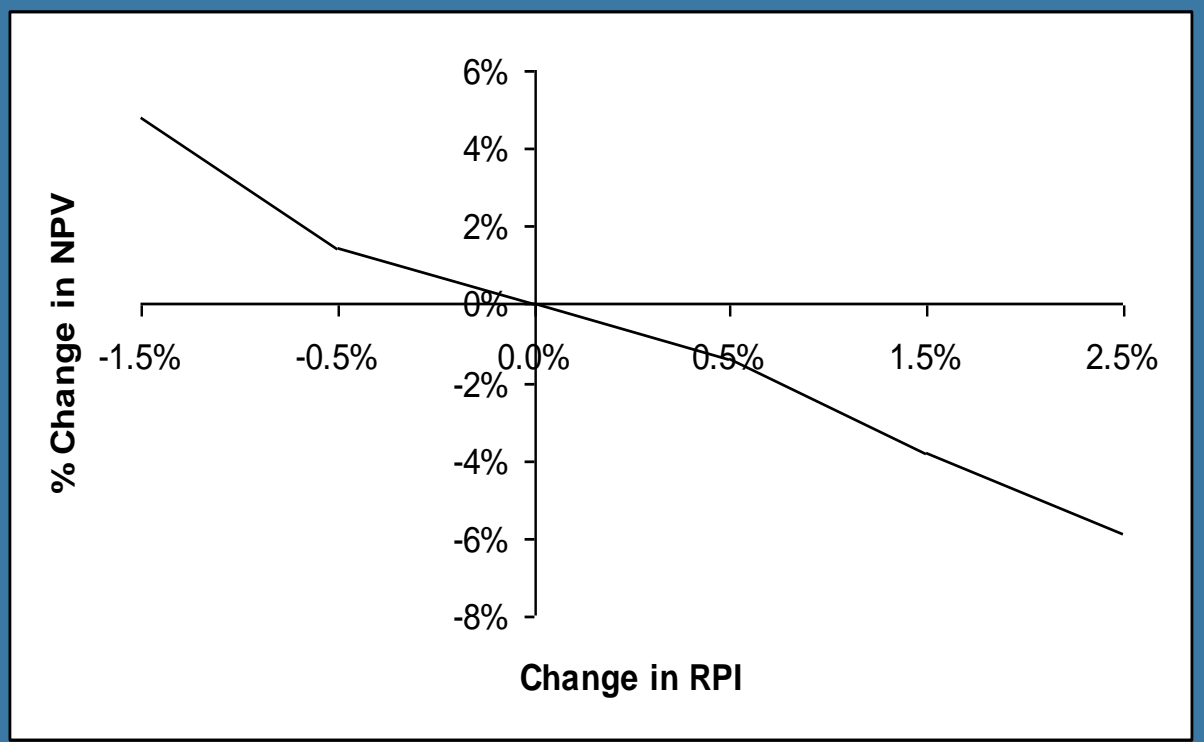
How much? Case Study

- AVS Project Risk Analysis - The Procurer Interest Rate Sensitivity Spider Diagram



How much? Case Study

- AVS Project Risk Analysis - The Procurer Inflation Sensitivity Spider Diagram

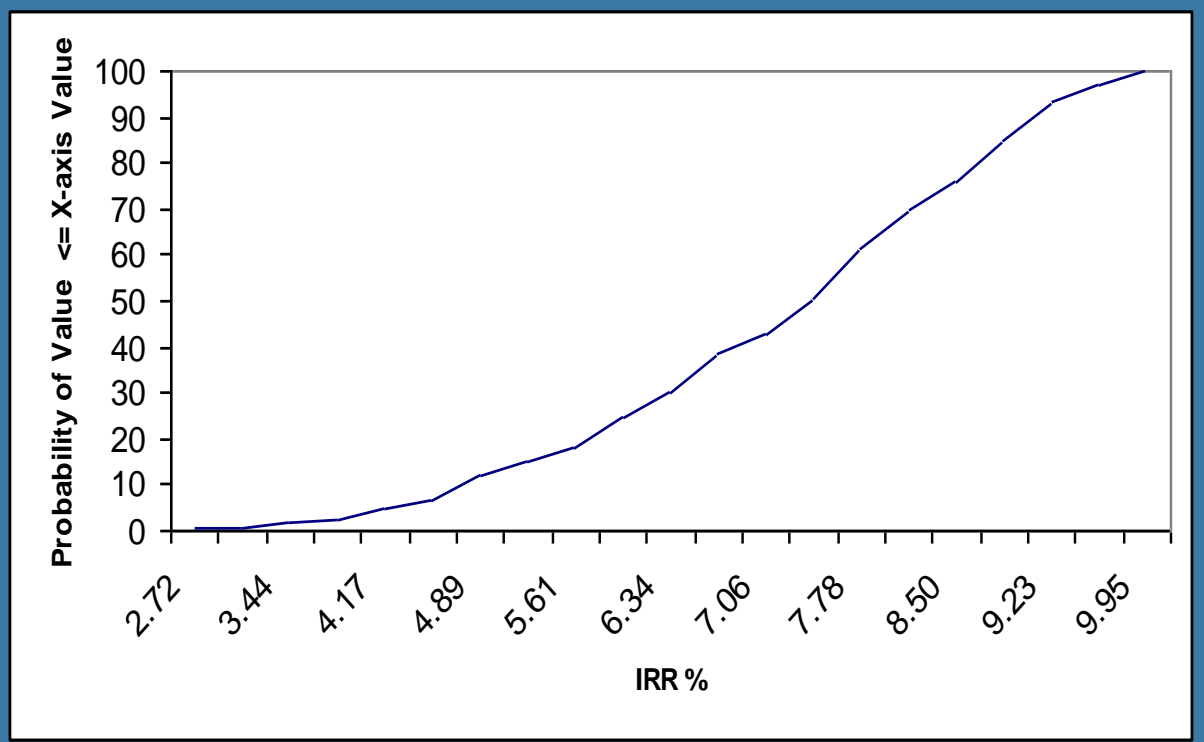


How much? Case Study

- AVS Project Risk Analysis - The Sponsors
 - Blended Equity Return
 - Volume Risk
 - Mid-life Capital Expenditure
 - Operating Costs
 - Performance
 - Simulation

How much? Case Study

- AVS Project Risk Analysis - The Sponsors Cumulative Frequency Curve for Equity IRR



How much? Case Study

- AVS Project Risk Analysis - The Lender
 - Limited Recourse
 - Severe Downsides
 - Impact on Cover
 - Historic....Annual Debt Service Cover Ratio
 - Future....NPV Loan Life Cover Ratio

How much? Case Study

- AVS Project Risk Analysis - The Lender

| Sensitivity | Change | ADSCR | LLCR |
|----------------------------------|---------------|--------------|-------------|
| Base Case Financial Model | - | 1.26 | 1.32 |
| Construction Cost | +3% | 1.26 | 1.32 |
| OPEX | +12.5% | 1.08 | 1.15 |
| Downside Flow | -13.5% | 1.07 | 1.12 |
| Midlife CAPEX | +10% | 1.24 | 1.29 |
| Operational Performance | -2% | 1.20 | 1.26 |
| Combined Downside: | | | |
| Downside Flow plus Midlife CAPEX | | 1.04 | 1.10 |

How much? Case Study

- Key Issues - Risk Analysis Techniques
 - The Procurer
 - Probability Analysis on Quantified Risks
 - Sensitivity Analysis on Key Macroeconomic Factors
 - The Sponsor
 - Simulation Analysis on Return
 - The Lender
 - Severe Downside Analysis

In Summary

- A project has an environment and components
- Risk are events that can be predicted
- Uncertainty describes events that can't or are unknown
- There are two types of risk: Project; and Market
- Overall risks remain unchanged by finance or procurement model
- Although they may change value!
- In Victoria project risks in the cashflow and market risks in the discount rate
- No guidance available on uncertainty!

Thank you

Questions???

