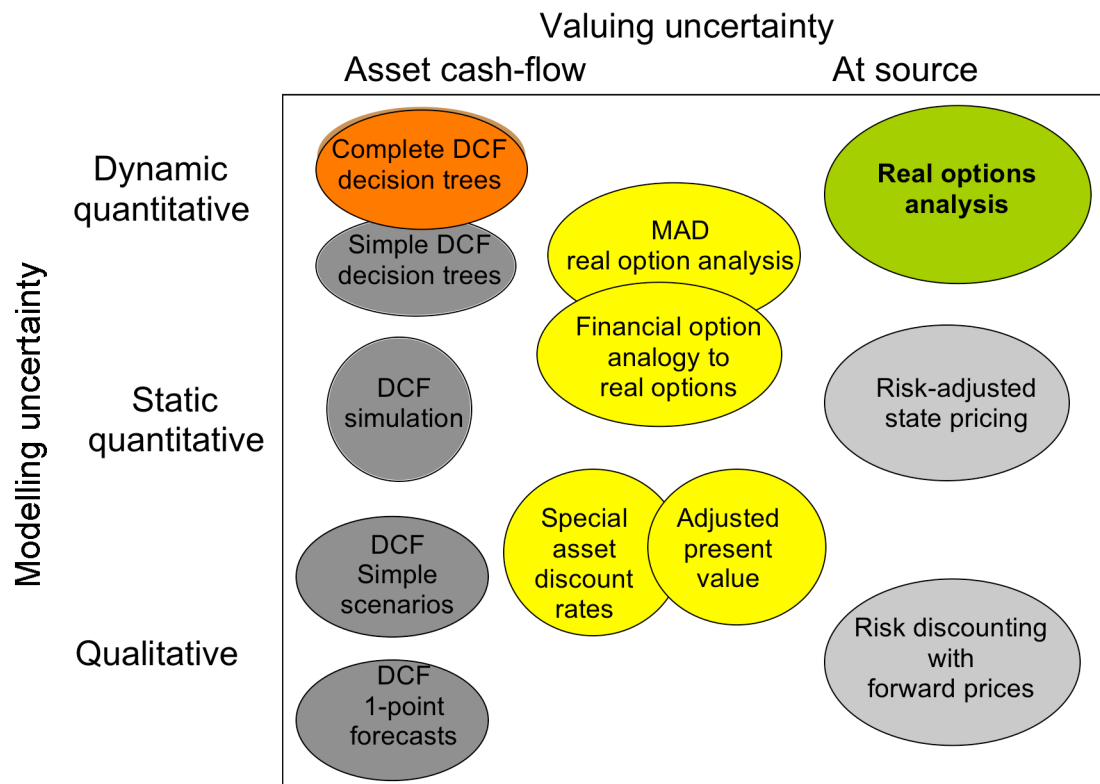


Mining and Upstream Petroleum Asset Design and Management: What Financial Market Value Estimation Methods Can Tell Us about Increasing Real Asset Value

The outline of a 3-day course
presented by David Laughton

The Banff Taxonomy of Real Asset Valuation Methods



1 Introduction and Executive Overview

- 1.1) Introductions, review of expectations, and discussion of the agenda.
- 1.2) The role of asset value estimation in the corporate process for making decisions about real asset design and management
- 1.3) A brief description of a few of the decisions to be considered in the course
- 1.4) The Banff Taxonomy of methods for estimating asset value
- 1.5) The interaction of real asset valuation and strategic planning, and the implications for choice of valuation methods
- 1.6) Organisational issues in changing the process for real asset valuation
- 1.7) Why some approaches to "real options" are a dead end
- 1.8) Some concluding remarks

2 Modelling and Valuation Mechanics

- 2.1) Modelling uncertainty
- 2.2) Valuing uncertainty

3 Some case examples

- 3.1) A forward pricing case (from list at end)
- 3.2) A state pricing case (from list at end)
- 3.3) A decision tree case (from list at end)

4 Market-Based Valuation (MBV) in a special setting: Using forward prices

- 4.1) Using the Law of One Price to set up a forward price valuation
- 4.2) Prices of risk and the effects of different types of uncertainty on value
- 4.3) *Participants reexamine forward pricing example*

5 MBV in a general setting without the analysis of future flexibility: Using state prices

- 5.1) The simplest example:
Asset valuation in one time period with two scenarios
- 5.2) Generalising to many time periods

6 Analysis of future flexibility: Using decision tree analysis

- 6.1) A simple example of one- and two-period development leases

7 Different patterns of uncertainty

- 7.1) Local uncertainty
- 7.2) Commodity markets with short-term shocks and long-term equilibrium

8 Small cases to illustrate the use of state pricing

- 8.1) Old Scona 1
- 8.2) *Participants analyse and report on one of :*
 - 1) *Old Scona 2*
 - 2) *Peace River Fine Papers*

9 Generalising state pricing to continuous states

- 9.1) Continuous models of uncertainty: The example of commodity price diffusion models
- 9.2) Risk adjustment in continuous state models
- 9.3) Specification and parameterisation of uncertainty
- 9.4) Some computational issues

10 Cases to illustrate state pricing with continuous states over many time periods and to introduce relevant software

- 10.1) A reexamination of the cases used to illustrate state pricing or real options analysis
- 10.2) ***Participants choose two cases from a selection to analyse using:***
 - 1) ***random sampling methods for numerical integration***
 - 2) ***dynamic programming***

11 Review and next steps

Cases

Forward pricing

- 1) Natural gas: Outsource processing and/or gathering or not?
- 2) Natural gas or copper: The production capacity choice
- 3) Mature oil field extension and abandonment: The deterministic timing choice
- 4) SAGD heavy oil production: Sell heavy or upgrade and sell light?
- 5) Power plant design: Build CO2 capture ready or not, given a deterministic timing choice?

State Pricing

- 1) Offshore oil development with oil-in-place uncertainty: Processing and transport choices
- 2) A comparison of the effects of different fiscal systems on the value of "now or never" resource development projects
- 3) Mature oil field extension and abandonment with production uncertainty: Testing simple timing choices
- 4) CO2 geological sequestration: The deterministic timing choice

Decision Trees

- 1) Mature oil field extension and abandonment with production uncertainty: The dynamic timing choice
- 2) When is enough enough: Timing the decision to sanction development
- 3) Multiblock mine plans
- 4) Management of exploration and appraisal
- 5) Power plant design: Build CO2 capture ready or not, given a dynamic timing choice?

More information about the course, including a more detailed outline, and about Dr. Laughton, comments on his work, and some applications of MBV methods, are available at www.davidlaughtonconsulting.ca.