

AGSM

Term 4, 2006

5302 ECONOMIC INVESTMENT APPRAISAL

or: *Beyond the Bottom Line!*

3 October 2006
bobm@agsm.edu.au
www.agsm.edu.au/~bobm/teaching/EIA.html

R. E. Marks
Room 305
Ext. 271

Reading/Reference List and Subject Outline.

EIA provides you an opportunity to begin to apply the new knowledge and techniques of the core to real issues and decisions — the main piece of work for this course is a project on a topic of your choice, done individually or with one or two colleagues. EIA is of special interest to would-be consultants.

EIA is designed to help today's private- or public-sector manager reach "bottom-line" decision — in which *all* aspects of a project can be expressed in dollar terms — in an increasingly complex world in which he or she must cope with the effects of such things as

- exchange-rate movements,
- taxation, and
- environmental constraints, in addition to
- the pervasive uncertainty attached to any long-term project.

Unfortunately, even being able to cope with these complexities is not enough. Increasingly, decision makers must pay heed to *non-market costs and benefits* of projects, and to conflicting claims and effects which have ramifications beyond the direct environs of the project itself. Because of the interaction among the multitude of factors affecting small and large projects, it is essential for the manager to identify the important ones and to determine the degree to which they affect each other before making a clear decision. This course will also examine ways of evaluating such projects, to identify the decision criteria and other factors—whether intangible or concrete—to measure the interactions among them in a simple way, and to synthesize all information in order to achieve a simpler decision.

The course is divided:

- a. cost-benefit analysis from the perspective of both private- and public-sector organizations;
- b. valuing the environment — how to do it;
- c. decision-making under uncertainty — decision analysis;
- d. multi-attribute decision analysis — many dimensions; and
- e. class discussion of a variety of actual projects and case-studies, in which learning takes place by a consideration of the often severe problems which confront those who evaluate projects and make decisions. Ways in which studies and decisions might have been improved upon will be a feature of these discussions.

The course will culminate with sessions in which students present and if need be defend their own draft evaluations of private- or public-sector projects or decisions. Exemplary past student projects are available for borrowing from me.

Teaching will mostly be lectures, with student presentations. There will be no final exam. Assessment will be based on a term project, on a midterm and two assignments, and on a classroom rôle-playing exercise on a topic to be announced. A Package of readings is on sale at Reception.

Outline:

Week

1. Introduction
 - Decision-maker's objectives: efficiency v. equity.
 - Financial appraisal v. cost-benefit analysis.
2. Basics of Project Evaluation
 - Criterion: NPV (VOC, annuities), IRR, payback period, B/C ratio.
 - Inflation, taxes, discount rates.
 - Capital rationing.
3. Shadow Pricing; Effects of Price Changes & Welfare Economics
 - Producer's and consumer's surplus.
4. Indirect Price-Change Effects
 - Pecuniary external effects.
5. Valuing the Environment & Other Unmarketed Goods
 - Value of time saved.
 - The travel-cost method.
 - Hedonic pricing.
 - Contingent valuation.
 - Value of human life.
6. Risk-Benefit Analysis
 - Encoding uncertainty.
 - Certain equivalence.
 - The value of perfect information.
7. Multi-Attribute Decision Analysis
 - Pairwise comparisons, satisficing.
 - Lexicographic ordering.
 - Additive value models.
8. Case Studies & the Rôle-Playing Exercise
9. Student Presentations

Readings:

The recommended text is:

Harry Campbell and Richard Brown, *Benefit-Cost Analysis: Financial and Economic Appraisal Using Spreadsheets*, Cambridge: C.U.P., 2003. AGSM 658.1554/29

As well, the following books may be found useful:

Department of Finance, *Handbook of Cost-Benefit Analysis*, Canberra: AGPS, 1997. (Out of print.) AGSM 658.1554/11

Frances Perkins, *Practical Cost Benefit Analysis: Basic Concepts and Applications*, Melbourne: Macmillan, 1994. (Out of print.) AGSM 658.1554/19A,19B

Sugden R. and A. Williams, *The Principles of Practical Cost-Benefit Analysis*, Oxford: OUP, 1978. (Out of print.) AGSM 339.41/6,12,13

Sinden J.A. & Thampapillai D.J., *Introduction to Benefit-Cost Analysis*, Melbourne: Longman, 1995. AGSM 658.1554/21

Additional readings will be found below. Recommended readings are marked with an asterisk (*); alternatives are marked with a dagger (‡); the others are included for your interest.

1. Introduction

***Campbell & Brown:** Chapter 1: Benefit-cost analysis: introduction and overview.

**Economist*, The MBA cost-benefit analysis, 1 April 1995 (Package, 2).

**Economist*, Private profit, public service, 9 Dec 1995 (Package, 3)

**Economist*, A modest undertaking, 4 March, 2004 (Package, 1)

<http://www.copenhagenconsensus.com/>

**Economist*, The regulator's best friend, 31 May, 2005 (Package, 4)

Further reading:

See below.

2. Basics of Project Evaluation

***Campbell & Brown:** Chapter 2 Investment appraisal: principles; Chapter 3 Investment appraisal: decision rules; Chapter 4 Private benefit-cost analysis: financial analysis; Chapter 10 The social discount rate, cost of public funds, and the value of information.

**Economist*, Deep discount, 26 June 1999. (Package, 6)

**Luenberger*, The basic theory of interest, *Investment Science*, OUP, 1998. (Package, 5)

Further reading:

(See below.)

3. & 4. Shadow Pricing, and the Direct & Indirect Effects of Price Changes & Welfare Economics

***Campbell & Brown:** Chapter 5: Efficiency benefit-cost analysis; Chapter 7 Consumer and producer surplus in benefit-cost analysis.

**Pearce D.*, A case study: the Gordon-below-Franklin dam. (Package, 7)

Further reading:

(See below.)

5. Valuing the Environment and Other Unmarketed Goods

***Campbell & Brown:** Chapter 12: Valuation of non-marketed goods.

*Litman, Policy implications of full social cost, *AAPSS*, 1997. (Package, 8)

*Sinden & Thampapillai, Valuation without market prices. (Package, 9)

*Diamond & Hausman, On contingent valuation measurement of nonuse values. (Package, 11)

Further reading:

Pearce, D., A. Markandya and E. B. Barbier, Appendix to Valuing the environment, *Blueprint for a Green Economy*, London: Earthscan Publications, 1989. (Package, 10)

Lomborg, B., The truth about the environment, *Economist*, 4 Aug 2001 (Package, 12)

Economist, Never the twain shall meet, 31 Jan 2002. (Package, 13)

6. Decision Analysis and Risk-Benefit Analysis

***Campbell & Brown:** Chapter 9 Incorporating risk in benefit-cost analysis.

**Economist*, The price of life, Putting a value on life, The health effect, and A price for pain? (Package, 14).

*Hammond J.S., Keeney R.L., Raiffa H., Chapters 7 and 8, *Smart Choices: A Practical Guide to Making Better Decisions*, Boston: HBS Press, 1999.

*Dixit A. and Pindyck P., The option approach to capital investment, *Harvard Business Review*, May–June, pp. 105–115, 1995. (Package, 18).

Further reading:

(See below.)

7. Multi-Attribute Decision Analysis

*Hammond J.S., Keeney R.L., Raiffa H., Even swaps: a rational method for making trade-offs, *Harvard Bus Review*, March-April, 1998, pp. 137–149. (Package, 20)

*Perry C. and J. L. Dillon, Multiple objectives and uncertainty in ex-ante project evaluation, in McMaster J. C. and G. R. Webb (eds), *Australian Project Evaluation*, Sydney: ANZ Book Co, 1978: Chapter 9. AGSM 658.1554/7. (Package, 19)

Further reading:

(See below.)

8. Case Studies

8.1 Greenhouse

*Marks and Swan, Abatement. (Package, 23)

**Economist*, Changing science, Dec 8, 2005. (Package, 24)

**Economist*, Can business be cool? June 8, 2006. (Package, 25)

*Wolf M., Do we need to cry now that the wolf is at the door? *Financial Times*, July 12, 2006. (Package, 26)

Economist, A survey of climate change, September 9, 2006.

8.2 Drugs Policy

*Landsburg S.E., Choosing sides in the drugs war, *The Armchair Economist*, NY: The Free Press, 1993 (Package, 28)

*Marks, R. E.: The costs of Australian drug policy. (Package, 27)

Further reading:

Economist, A survey of illegal drugs, July 26, 2001 (handout)

Access Economics, Illegal drugs, *Economics Monitor*, Oct. 1997. (Package, 29)

8.3 General cost-benefit studies

**Economist*, Dam good business this, chaps, 26 Aug. 1995, and Dambuilders and dambusters, 19 April 1997 (Package, 21).

**Economist*, The price of imagining Arden — valuing the environment, 3 Dec 1994 (Package, 22)

Further reading:

(See below.)

8.4 Case studies in decision analysis and risk

*Passell P., How much for a life? Try \$3 million to \$5 million. *New York Times*. (Package, 15)

**Daily Telegraph*, We have to put a price on life. (Package, 16)

**Economist*, Apocalypse maybe, 30 March 1996 (Package, 17).

Further reading:

(See below.)

8.5 The Second Sydney Airport / The Third Runway

Kinhill Engineers Pty. Ltd., Summary, *Proposed Third Runway, Sydney (Kingsford Smith) Airport, Draft Environmental Impact Statement*, Sydney: Federal Airports Corporation, Sept. 1990.

Sanders, Will, Sydney's airport needs: a comparative and historical perspective, *Current Affairs Bulletin*, vol. 66, no. 6, pp. 19–27, Nov 1989. (Reserve)

Taylor, David, Why Sydney Airport needs its third runway now, *Australian Director*, Feb/March 1989. (Reserve)

8.6 Alternative transport modes: road versus buses.

Pearce & Nash: Chapter 11, The social appraisal of transport projects.

Bureau of Transport & Communications Economics, Forgone production costing model, *Social Cost of Transport Accidents in Australia*, Canberra: AGPS, 1992. (Package, 30)

8.7 The Games of the XXVII Olympiad

Plus additional items.

Performance Audit Report, *Sydney Showgrounds, Moore Park: Lease to Fox Studios* Australia Audit Office of NSW, AGSM 333.3375/1

5302 ECONOMIC INVESTMENT APPRAISAL

October 2006

R.E. Marks

Assessment

There will be no final exam. Instead there will be:

- two assignments (each 5%);
- an exam (30%) in Week 6, on Monday, November 6, in class;
- a rôle-playing exercise (5%); and
- a term project (55%).

The rôle-playing exercise, on a topic to be announced, will be performed and marked in designated groups; each group will assess the performance of all other groups, which will provide the basis for students' assessments in the exercise.

The term project should be an attempt to apply some of the theory covered in the course to a particular project/decision or evaluation/decision-making procedure. If you wish, you may form teams of two (or with my permission of three) for the term project. I'd like an **outline** of *the topic, the approach to be adopted, and the data sources* (no more than two pages, please) by Thursday, November 2nd; the complete paper is due by 4pm on Wednesday, December 13th. (See the Notes on Writing in the Web — <<http://www.agsm.edu.au/~bobm/teaching/EIA.html>> — for the length.) Each student or team will give a short briefing to the class before the end of term on the contents and conclusions of the paper.

Some possible (but by no means exclusive) areas for projects are:

1. The net return to Australia of the Sydney Olympics.
2. A fast train from Sydney to Canberra and beyond.
3. The Darwin–Alice Springs railway.
4. Using the geothermal water in southern Victoria for heating, cooling, etc. www.industry.gov.au/aen
5. The Pharmaceutical Benefits Scheme of subsidised prescriptions.
6. The “Iron Mississippi” railway from Melbourne to Darwin.
7. The second Sydney airport — where?
8. Burying (“undergrounding”) phone, cable-TV, and electricity lines. (See www.ipart.nsw.gov.au)
9. Using the Internet and its multi-media possibilities to deliver the AGSM's MBA, EMBA, etc.
10. Faster access to Sydney's northern beaches.
11. The Melbourne Grand Prix.
12. A trans-Australia gas pipeline.
13. Oil drilling on the Great Barrier Reef.
14. Extending daylight-saving time (“summertime”).
15. Large-scale water desalination projects.
16. The Third Runway at Mascot (Sydney) Airport
17. The North Queensland Spaceport
18. Sydney's Inner West Redevelopment Project
19. The Sydney Water Board's treatment projects
20. Turning the rivers inland.
21. The domestic fibre-optic network
22. The Eastern Creek raceway fiasco
23. The Sydney–Melbourne “Tilt” Train
24. The Fast Freight Train/National Rail Freight System

25. The Bass Strait Electricity Link/National Electricity Grid
26. Private power stations (building or selling).
27. A proposal to make the wearing of seat belts/cycle helmet voluntary.
28. Examination of the risk/benefits of (hypothetical?) proposals for improving road safety, or air safety, or the safety of new drugs.
29. Examination of “lumpy” business projects, which might be large in relation to the company, to the local area, or to both. (Evaluation of such projects may benefit from some of the techniques presented.)
30. Analysis of the revealed implicit social valuation of human life in 2006 Australia.
31. Analysis of the revealed implicit risk tolerance of the Australian public
32. Examination of a (hypothetical) policy to require adventures (mountaineers, wilderness venturers, sea-faring wind-surfers, white-water canoeists, etc.) to take insurance out against necessity for government search-and-rescue teams to save them.
33. Use of CBA techniques to aid an actual decision, and an evaluation of the procedure. (From your previous work experience, perhaps.)
34. The similarities and differences between public- and private-sector project evaluation.
35. The risks and returns from increasing the allowable blood alcohol content from 0.05% to 0.08%.
36. The Rasmussen report on nuclear safety, risks, and uncertainty.
37. Bond University, or other private universities.
38. Sydney freeways.
39. Standardisation of the Melbourne–Adelaide railway.
40. Education vouchers.
41. Privatisation of QANTAS, of the NSW Electricity System.
42. An assessment of the social costs of the AIDS epidemic.
43. The large bank you are working for is considering financing a consortium to undertake some large-scale project which might be the second-stage of the North West Shelf natural-gas development, tourist development, a large new shopping mall, hyper-market or whatever. Use your imagination or your contacts to choose and evaluate the viability of such a project. Evaluate the project from both a “financial” and an “economic” viewpoint and contrast the differences.
44. Approach a company with which either you or Faculty have contacts that is undertaking a new project. Provide an independent evaluation of the project but drawing on information provided by the company where appropriate.
45. The Sydney Harbour Bridge Tollroad.
46. AGSM’s Australian Open Learning Program.
47. Performance evaluation of public enterprises.
48. Some aspect of the micro-economic reform program.
49. Some aspect of environmental policy or the greenhouse effect.
50. Private toll roads or electronic road pricing.
51. Or anything else you may think of — which may be in your home country, not here.

I have some papers from previous years. Please see me to borrow them, and to discuss perhaps using them to write a new analysis of your own.

Author	Title
Abbott	BHP Mini Steel Mill
Adams	Harris-Daishowa woodchip project
Alcorn	Westfield Bondi Junction development
Allen	GPS for all trucks
Alston	Australian Technology Park
Anthony	Mobil’s Port Stanvac refinery closure
Arasu	CBA of the MBA
Armstrong	CBA of the Kudankulam Nuclear Power Station
Au	Harris-Daishowa revisited
Bain	Kingsford Smith Airport and the Third Runway
Baldwin	Heroin Policy Alternatives for Aust
Beale	Lake Cowal Gold Mine
Benschere	Smoking ban in NSW clubs & pubs

Bize	A Sydney CBD congestion charge
Blewitt	Proposed Toll Methodology for the Sydney Harbour Tunnel
Blundell	Social cost of viral hepatitis in Australia
Bolton	Raising the Super Preservation age from 55 to 65
Boyd	90 or 110 km/hr on the F3?
Brindley	The NSW Rugby League Draft
Bryant	Adelaide's Grand Prix
Cameron	CBA of Alcohol in Australia
Carr	Economic Impact of AIDS in Aust
Christanto	Mandarin FM radio in Sydney
Coe	The Social Cost to Australia of AIDS
Conde	Site Selection for a Second Sydney Airport: A CBA
Cordingley	Millers Point, "The Rocks" land review
Dabill	The NBA Grizzlies' Move from Vancouver to Memphis
Dang	CBA of Smoking Regulation
Dennon	Bar-Code Scanning at the Supermarket
Digwood	The Sydney Monorail: A CBA
Doepel	Rainforests or jobs in NSW?
Dolling	Direct-to-consumer marketing of prescription drugs
Doueihi	Medicare reform
Drimer	Australia's plastic money
Duck	The M5 East motorway
Farmer	Australia in East Timor
Fricke	Paid maternity leave
Godden	Partnerships for Development or Partnerships for Disaster?
Gorman	An EIA into a Proposed new Light Rail Link—S.E. Sector
Harrington	A heliport for Sydney's CBD
Henderson	The <i>Young Endeavour</i> Youth Scheme
Ho	Lighting the Pacific Highway
Horstman	CBA of Runway Expansion based on Efficient Pricing
Jackson	CBA of Woronora River Bridge
Jayarathne	The Argyle Diamond Mine Project (ADM): A CBA
Jofre	Ok Tedi mine in PNG
Johnson	Oil Drilling on the Great Barrier Reef
Kam	The Coronation Hill Mine
Kerr	Stuart oil shale
Killeen	Retention of Russell Park Reserve, Drummoyne
Le Livre	Hunter Valley solar thermal power project
Lee	A Proposed Congestion Tolling System for the Sydney Harbour Bridge
Licari	A CBA of the Spit Bridge
Lord	Poker machines in Victoria
Love	The Dawesville Channel
Luk	Jabiluka Uranium Mine
McCaffery	Sydney Airport International Terminal Expansion
Mehling	CBA of Diaper (Nappy) Usage
Michael	A Fast Railway between Sydney, Canberra & Melbourne
Miller	CBA of the New Southern Railway (NSW)
Mitchell	A CBA of Woolplan
Nagao	The Eastern Distributor for Sydney 2000 Olympics
Nespolion	Modifying the PBS
Nordestgaard	The Very Fast Train
O'Donnell	A CBA of the Proposed 1992 Olympic Games in Brisbane
Oke	Decisions without Market Prices: The Proposed Oxley National Park
Paul	The VFT
Paxevanos	Optus cable rollout
Proud	Crook Backs: Back Injuries and the NSW Workers' Compo Scheme
Pun	Linking the F3 Freeway to Braxton
Purves	A CBA of Memtech's Membio project
Renner	Olympic beach volleyball at Bondi

Roberts	Bond Corp.'s Skytower project
Ross	Going on (student) exchange
Ryan	The F2 Freeway
Sewell	The Pavilion, Manly: A CBA
Shanahan	AGSM vs. UBC: a CBA of the MBA Degree
Skott	The M2 Hills Motorway
Song	Retaining Middle Harbour as public land
Swinburn	Random Breath Testing in NSW
Warn	Musselroe wind farm
Weeks	Going abroad for an MBA
Ying	The Shanghai's Pudong New Area in China
Yong	The Bakun Hydro Dam Project
