

ECONOMIC INVESTMENT APPRAISAL

or

Beyond the Bottom Line!

Robert Marks

Week

1. Introduction; Financial Appraisal v. Cost-Benefit Analysis

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- 1. Introduction; Financial Appraisal v. Cost-Benefit Analysis**
- 2. Basics of Project Evaluation**

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Assessment

Prerequisites

How I Teach —

Topics introduced through lectures:

How I Teach —

Topics introduced through lectures:

— Talk

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- **Talk**
- **Use of PDF slides/ OHP slides**

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Interaction, discussion, rôle-playing exercise, assignments, mid-term exam, term project. No tutes, but worked exercises are available.

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IEA is not for everyone — doesn't *directly* help the firm's bottom line. Cost-benefit analysis.

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No class on Friday 30th April, makeup on Wednesday May 5th. No classes on 21st and 25th May, makeup TBA.

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- 1. Intro — decision-making issues.**

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3. A weak ethical criterion: Pareto Improvement. The *efficiency criterion*: The Potential Pareto Improvement Criterion (PPIC), in which the size of the pie is the issue, not the sizes of the slices.

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4. Comparing Cost-Benefit Analysis (CBA) with Financial Appraisal (FA).
5. The use of *opportunity cost*, not accounting cost, in CBA.

1. Introduction

Five Principles

(See Landsburg in the Package.)

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Only Individuals Matter

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Only Individuals Matter

+

All Individuals Matter Equally

(A \$ is a \$)

THE WORLD IS COMPLEX:

→ two approaches

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□ *deductive, reductionist*

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- *deductive, reductionist*

- *systems (holistic)*

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Analyst/Decision maker can

1. set priorities → weightings
2. generate a set of alternatives
3. choose “best” alternative
4. need a *performance measurement*, however

Is this a tall order?

e.g. choosing chemical-processing equipment

e.g. choosing a word-processing system

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**(emergence of standards
e.g. MS Word)**

2. How Can We Compare:

- the pluses & minuses ?
- the advantages & disadvantages ?
- the benefits & costs ?

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The finance boys & girls: “The \$ bottom line!”

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The finance boys & girls: “The \$ bottom line!”

but is that sufficient?
(it's necessary—why?)

But what if:

- market prices \neq social values?

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**Then use techniques of Cost-Benefit Analysis
(Examples)**

→ Prescriptive “ought”

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→ Prescriptive “ought”

not

Descriptive “is”

Objectives of the Decision Maker

Let us distinguish first:

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“what is” – descriptive from

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 - when prices change because the project is sufficiently large
 - social discount rate \neq private discount rate

Cost-Benefit Analysis:

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Q: objective, measurement ?

A: welfare of each individual ideally

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→ common unit to measure aggregate
costs & benefits *shadow prices*

Shadow Prices



market prices \neq necessarily shadow prices
(*social* benefits & costs at the margin)

how

**to identify
measure
compare**

**changes in
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→ Pareto Principle		

2. Potential Pareto Improvement Criterion (PPIC)

[see C&B Ch. 1, FP Ch. 1.5, 4.1; S&W, Ch. 7]

a *Pareto Improvement* = a change that makes at least one person better off & no-one worse off (a measure of increasing economic efficiency, or reducing waste)

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a project is OK under PPIC (or Kaldor-Hicks criterion) if *in principle* it is possible to secure an actual Pareto improvement by linking the project to a set of money transfers between the “gainers” and the “losers”, in such a way that in principle no-one is worse off, even if these transfers don't actually take place, i.e., a potential improvement.

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e.g. the noise cost of airport expansion.

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- **losers:** minimum amount (\$) you'd accept to put up with the project?
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**Then: If $\sum \text{gainers } \$ > \sum \text{losers } \$$
then the PPIC is satisfied.**

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(everyone has their price) (“pricing out”)**

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4. truthfulness (although perhaps there are techniques to reward truthfulness)

How appropriate is the PPIC as a “social objective”?

Two alternatives suggested by S&W:

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1. *decision-making approach (DMA)*

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1. **DMA:** The decision maker's objectives are the social objectives, by definition

CBA: process of appraising projects, given the DM's chosen objectives can be private

The Paretian Approach

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2. PA: objectives of the decision maker *should* be distilled from a consensus of the value judgements of the individuals in society

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2. PA: objectives of the decision maker *should* be distilled from a consensus of the value judgements of the individuals in society
- independent of political process
 - a “consensus value-judgement”, which can be identified using welfare economics
i.e. using *Consumers' Surplus* (revision)

Comparing the DMA with the PA

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→ economic efficiency: size of the cake
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→ economic efficiency: size of the cake
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distributional justice: relative size of the slices

PPIC: a change is “good” if → greater economic efficiency

winners v. losers

[C&B Ch. 5, DoF Ch.2]

PA: “economic rationalism”

Efficiency v. Equity

Less efficiency,
greater equality.

*Smaller cake,
more even slices.*

more equal

• **A**

Greater efficiency,
greater equality.

*Larger cake,
more even slices.*

• **B**

Status Quo Ante

efficiency

Less efficiency,
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Efficiency v. Equity or Fairness

(lexicographic ordering)

Two questions:

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1. Can an unbiased decision maker exist?

Two questions:

1. Can an unbiased decision maker exist?
2. How should the decision maker choose between:



assuming there is a conflict?

4. Comparison of FA & CBA

[C&B Ch. 4, FP Ch. 1, 6]

Often Cost-Benefit Analysis (CBA) ~ Financial Appraisal (FA)

e.g.

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[C&B Ch. 4, FP Ch. 1, 6]

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e.g. A large project requires the purchase and use of 1000 t of bricks

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e.g. A large project requires the purchase and use of 1000 t of bricks

FA: know market prices (bricks cheapest)

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Often Cost-Benefit Analysis (CBA) ~ Financial Appraisal (FA)

e.g. A large project requires the purchase and use of 1000 t of bricks

FA: know market prices (bricks cheapest)

CBA: welfare of owners of brickworks

employees of brickworks

other users of bricks

etc.

So far, so good ...

Competitive markets → no problems

*but if (IF) there is a competitive market economy,
(with no externalities)*

brick price = MC of brick production = MV to users
wage = MV of leisure = MV of labour
to workers to brickworks
& so long as no prices change, *then*

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and FA = CBA

(so long as there is no price change)

Lack of a competitive market → problems.

But

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But

- perfect competition is rare

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- prices may adjust to project (because of its size)

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- taxes exist

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∴ FA \neq CBA necessarily

Differences between economic and financial analysis

	Economic analysis CBA	Financial analysis FA
Viewpoint	Society as a whole	Individual, firm, or household.

Differences between economic and financial analysis

	Economic analysis CBA	Financial analysis FA
Viewpoint	Society as a whole	Individual, firm, or household.
Objective	Increase in welfare	Increase in individual, firm, or household profit or income.

Differences between economic and financial analysis

	Economic analysis CBA	Financial analysis FA
Viewpoint	Society as a whole	Individual, firm, or household.
Objective	Increase in welfare	Increase in individual, firm, or household profit or income.
Benefit	Any kind of satisfaction or increase in welfare, including monetary revenue.	Monetary revenue.

Differences between economic and financial analysis

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Source: *Techniques to Value Environmental Resources: An Introductory Handbook*, Canberra: AGPS, 1995.

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(Write down your answer.)

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Example [S&W, pp.35–36]: *Service A or B?*

A private bus company:

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1. *Running Costs*

Suppose the differences in running costs reported by different bus fleets can be explained quite well by the equation (in \$'000):

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$b = 300$ buses (typical fleet)

$k = 48,000$ km/year/bus (both services)

$h = 3,000$ hr/year/bus (typical)

$$\rightarrow C = \$4,984,000/\text{y} \text{ excluding costs of buying} \\ \$4,984,000/\text{year}$$

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\$0.40/bus-km

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Characteristics of the two bus services

	Bus-km per week	Hours of service per week	Average speed (km per hour)	Additional buses required
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Accounting and opportunity costs of the two bus services

	Cost incurred in year(s)		Present cost in year 0
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\$0.40/bus-km → Accounting costs			\$ thousands
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So: Using the accounting cost of \$0.40/bus-kilometre understates the opportunity cost of Service A and overstates the cost of Service B.

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