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1 – INTRODUCTION

My conception of applied economy: “*there is a constant move to and from theory and the practice until there is (for a while) a strong correspondence between the two*”.

2 – ASSESSING PUBLIC POLICIES OR PROJECTS

Economist are good to assess project and worth to assess public policy.

Assessing public policies raises a number of problems:

What is exogenous?

What is endogenous?

What is the input, what is the output?

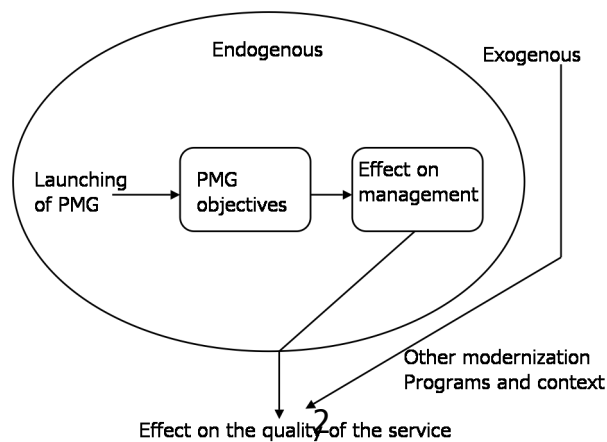
Take the case of the modernizing of public administration in Chile (may 2007).

Should we assess the effectivity of the implementation of impact of the PMG recommendation? The PMG’s effect on the management? It’s effect on final public service’s quality?

What is the share of the management’s change or the final service’s change which is driven by the PMG? What is the exogenous change?

The more the assessment is focused on a specific project (a bridge) the easier these problems are to solve.

When assessing a broad public policy, one has to use a great



3 – TYPES OF EVALUATIONS

Generally, one makes a distinction between three types of studies on economic evaluation. The difference between these three techniques lies primarily in the **manner of expressing the effects**: in **natural units** (for example years of life gained), in **units of utility** (for example years of life balanced according to the quality of life) and in **monetary units** (for example the euros).

Cost-effectiveness. It measures the effect of a project on a specific variable, i.e: number of life saved per unit of cost.

Cost-utility. The analysis *cost-utility* is an extension of the cost-effectiveness analysis which tries to gather all the effects under the same denominator, called in fact " QALY " or Quality Adjusted Life Year (year of life corrected according to the quality of life).

Cost-benefit. The cost-benefit analysis measures the effects in monetary terms. It differs from the other techniques on the conceptual level. Effects or benefit of one investment are measured on the basis of " availability to pay " questioned subjects. In the medical world, this measurement technique of benefit often encounters ethical objections: like it makes to intervene solvency, it amounts favouring the rich and disadvantaging the least fortunate. Although the application concretes cost-benefit analysis encounters many practical problems, circumvented within the framework of one analyze cost-effectiveness, this technique has a theoretical and conceptual sitted solid. By consequent, it allows a direct comparison between investments in care of health and investments in any field outside with the care of health.

A fourth type of study is the analysis of **minimization of the costs**. It seeks the most economic treatment while postulating that the effects of compared treatments are identical. The cost-effectiveness analysis is the technique most employed, and the majority of the economic evaluations published in the medical press make use of it. This technique also approaches the most medical logic and reveal simplest from the conceptual point of view.

4 – CBA’S THE UNDERLYING ASSUMPTION

Most of this class will be dedicated to Cost-Benefit analysis.

First, because it is the domain which is economist’s core business.

Second, because most of the techniques used to solve problem in the area, can be used in more ambitious assessment (impact evaluation, cost-utility)

Neo classical economy has been founded on the notion of individual, that is a person who makes decision on the basis of a comparison of benefits and costs.

CBA **extends** this to the area of government decision making by **replacing private benefits and costs with social benefit and costs**.

Let us use the definition of CBA given by Preston and Turvey (1968)¹ “*maximise the present value of all benefits less that of all costs, subject to a specific constraints*”.

These definition leads to four interrogations:

- Which costs and which benefits are to be included?
- How are the costs and benefits to be evaluated?
- At what interest rate the future benefit and costs to be discounted to obtain the present value (the equivalent value that is making or giving up today when the decision is being made?)
- What are the relevant constraints?

For CBA, the scope of the answer is wider than from private firm.

Few answers:

- **All** benefits and costs **are to be included**, consisting of **private** and **social direct** and **indirect tangible** and **intangible**.

¹ Preston and Turvey (1968)

- Benefits and costs are given by the standard principle of welfare economics.

- **Benefits** are based on the **consumer's willingness to pay** for the project.

- **Costs** are what the losers **are willing to receive as a compensation for giving up the resources**.

- The **social discount rate** (which includes the preference of future generation) is to be used for discounting the annual net benefit stream.

- Constraint are not allowed for separately, but included in the objective function. (i.e. a fund constraint is handled by using a premium on the cost of capital).

Finally let's recall that CBA is a **social analysis** because:

- The evaluation of **all the individuals** in society is included in CBA and not just the partly directed involved (consumers and producers of the project).

- **Distributional effects** are taken in charge by the analysis.

- **Market prices are not necessarily good indices** of individual's willingness to pay. The market price would therefore mean, that the market price was being adjusted to include effects that the market does not record or record imperfectly.

5 – PROBLEMS WITH THE RULE OF CHOICE

In CBA, problems of **preference aggregation** shed doubt on the willingness to pay ability to be used to describe the societal choice.

5.1 – Arrows impossibility

In CBA, costs and benefits are based on the concept of willingness-to-pay (WTP).

Benefits are the sum of the **maximum amounts that people would be willing to pay for a policy outcome**, and *Costs* are the **sum of the opportunity costs of the resources required by the policy**.

Benefits are first considered (measured in efficient and inefficient markets) and then costs (again measured in efficient and inefficient markets).

Although using net benefits as a basis for choosing efficient public policies is intuitively appealing, its implementation through the aggregation of willingness to pay amount of the members of the society confronts a fundamental theoretical limitation; **ranking policies in terms of net benefits does not a guarantee a transitive social ordering in the polices.**

A transitive ordering requires that if X is preferred to Y, and Y is preferred to Z, then X is preferred to Z.

The logic of transitivity seems so clear that it is usually taken as an axiom of rationality in the preferences of individuals. We would certainly be sceptical about the mental state of someone who tells us he prefers apple to orange and orange to peaches but he prefers peaches to apple.

This violation of transitivity implies a **cyclical and therefore ambiguous ordering** of the alternatives: the ordering –apple orange peaches, apples- leaves us uncertain as to whether this person ranks apple lowest or highest in his preferences. Clearly transitivity is a desirable property of any preference ordering.

If every member of a society has a **transitive preference**, does it follow that reasonable procedures for aggregating their preferences will always produce a transitive social ordering?

An example make clear that the answer **is no**.

Consider a very common aggregation procedure, majority rule voting over pair of alternatives. Imagine that society consists of three voters who have preferences over three alternatives X,Y and Z.

Table 1 – Cyclical Social Preferences under Pairwise Majority Rule Voting

Preference ordering	Voter 1	Voter 2	Voter 3
First choice	X	Z	Y
Second choice	Y	X	Z
Third choice	Z	Y	X

Pairwise voting outcomes: X versus Y, X wins, Y versus Z, Y wins. X versus Z, Z wins

Implied social ordering: X is preferred to Y, Y is preferred to Z, but Z is preferred to X.

Is the possibility of obtaining an intransitive social ordering peculiar to the use of pairwise majority rule voting to produce rankings alternatively?

Surprisingly, it can result from any rule for creating a social ordering that satisfies certain minimal requirements. We cannot accept any rule for creating a social ranking of policy alternatives to be fully satisfactory.

In 1951, Kenneth Arrow **proved that any social choice rule that satisfies a basic set of fairness conditions could produce an intransitive social ordering.**

Arrow's general Possibility Theorem applies to any rule for choice in which two or more persons must select a policy from among three or more alternatives.

It requires any such scheme to satisfy at least the following conditions to be considered:

- First each person is allowed to **have any transitive** preferences over the possible policy alternatives (axiom of unrestricted domain).
- Second, If one alternative is unanimously preferred to the second, then the rule of choice will not select the second (axiom of **Pareto choice**).
- Third the ranking of any two alternatives should not depend on what other alternatives are available (**axiom of independence**).
- Fourth, the rule must not allow any one person dictatorial power to impose his preferences as the social ordering (**axiom of non dictatorship**).

Arrow's theorem states that any fair rule for choice (one that satisfies the four preceding axioms) **will not guarantee a transitive social ordering of policy alternatives.** That is possible that individual preferences are such that the social ordering will be cyclical.

Thus, unless the net benefit rule, which is a social choice rule, violates one of the axioms, it cannot guarantee a transitive social ordering of policies.

In order to ensure that the use of willingness-to-pay in the implementation of the net benefit rule would produce a transitive social ordering of policies, **some restrictions**, violating the axiom of unrestricted domain must be placed on the preferences that individual are allowed to hold².

Economic models commonly assume that individual preferences are represented by utility functions (numerical representation of preference ordering) that exhibit positive but declining marginal utility –other things equal- incremental consumption of any goods increase utility but not by as much as the previous incremental unit.

Unfortunately, this relative **weak restriction of the domain preferences** (it rules out preferences that cannot be represented by such utility function) is not enough to guarantee that the net benefit rule based on willingness to pay will always produce a transitive social ordering.

Two additional restrictions are required:

- the utility function of individuals must be such that the individual demand curves that they imply can be aggregated into a market demand curve with the sum of individual income as an argument;
- all individuals must face the same set of prices³.

The first restriction is quite strong in that it requires every individual demand of each good to **increase linearly with increasing income** and have the same rate of increase for each individual.

The second restriction, generally satisfied when all goods are traded in markets, may be violated when policies allocate

² For an overview see Charles Blackorby ; David Donalson "A Review Article: The Case against the Use of the Sum of Compensating Variation in Cost benefit Analysis" *Canadian Journal of Economy*, 23, n° 3 (1990), 471-494.

³ Charles Blackorby ; David Donalson "Consumers' Surpluses and Consistent Cost Benefit Tests" *Social Choice and Welfare*, 1, n° 4 (1985), 251-262.

quantities of good to individuals **who cannot resell** them in markets.

The necessity of restricting the allowed preference of individuals to guarantee a transitive social ordering from the use of willingness to pay in the implementation of the net benefit criterion makes clear that it is an imperfect criterion for assessing the relative efficiency of alternative policies⁴.

Of course, analysts **can avoid this theoretical problem** by assuming that the preference of the individual consumers conform to restrictive assumption consistent with the existence of an appropriate aggregate demand function.

Alternatively analysts can avoid the problem by assuming that **policies affect the price of only the single good** so that the choice is over a single dimension. Indeed analysts seeking to estimate willingness to pay typically work with an aggregate, or market, demand schedule for a single good, **implicitly assuming away price effects in the market for other goods**.

5.2 – Wealth effect

The **willingness** of a person to pay to obtain a desired policy impact will tend to be higher the **greater the wealth** that he has available. Consequently, the sum of the willingness of person to pay the benefit measured in CBA, depends of their levels of wealth.

If the **distribution of wealth in society** were to be changed, then it would be likely that **the sum of willingness** to pay amounts would change as well, perhaps altering the ranking of the alternative policies in terms of their net benefits.

The dependence of net benefits on net distribution of wealth **would not** pose a conceptual problem if losers from adopted **policies were actually compensated** so that the ad-

⁴ Even if one does not demand that the potential Pareto principle always produce a transitive social ordering of policies, the most commonly used measure of willingness to pay, compensating variation, can produce what are called Scitovsky reversals (Tibor Scitovsky "A Note on Welfare Proposition" *Review of Economic Studies*, 41, n°1, 1941, 77-88).

opted policies would produce actual, rather than potential, Pareto improvements.

From utilitarian perspective a Pareto improvements guarantee that the sum of the utilities of a society increases.

In application of the potential Pareto principle, however, it is possible that adopted policy could actually lower the sum of utilities if people with different level of wealth had different marginal utilities of money⁵.

As an illustration, consider a policy that gives \$10 of benefit to a person with high wealth and inflicts \$9 of costs on a person with low wealth. If the low wealth person's marginal utility of money is higher than that of the higher wealth person, then it is possible the utility loss of the low wealth person could outweigh the utility gain of the high wealth person.

Thus although the Pareto principle allows us to avoid interpersonal utility comparison guaranteeing increase in aggregate utility for person for policies with positive net benefit, the potential Pareto principle does not so.

The implication of the dependence of willingness to pay on wealth is that the justification for the potential Pareto principle **weaken** for policies that concentrates cost and benefits on **different wealth groups**.

Policies with positive net benefits that concentrate costs on low wealth groups may not increase aggregate utility; moreover, policies with negative net benefits that concentrate benefit on low wealth group may not decrease aggregate utility.

However if the potential Pareto principle is consistently applied, and adopted policies do not produce consistent losers or winners, the overall effects of the policies taken together will tend to **make everyone better off**. Hence concerns about reduction in aggregate would be unfounded.

⁵ The marginal utility of money is how much a person's utility change for a small increase in the person's wealth. Economists generally assume declining marginal utility of money. That is, as a person's wealth increases, each additional dollar produce smaller increase in utility.

5.3 – Assumptions about standing

The question of **whose** willingness to pay should count in the aggregation of net benefits has come to be known as the issue of standing⁶.

It has practical importance in at least three contexts: **jurisdictional definition of society, the exclusion of socially unacceptable preferences, and the inclusion of the preference of futures generations.**

A recognition of social constraint, right and duties often helps answer the question of standing.

The **most inclusive** definition of **society encompasses all people**, no matter where they live or to which government they owe allegiance.

So there is an open discussion to know **which is the relevant jurisdiction**, which must be considered: UN, province, region, town. One source of guidance for answering these questions is the system of legally defined rights. Add to that that CBA is anthropocentric.

People sometimes hold preferences that society seeks to suppress through widely supported legal sanctions. Should such socially unacceptable preferences be given standing CBA? **Some recommend to exclude unacceptable preferences, some does.**

6 – WHO NEEDS CBA

Who is using CBA?

Government employees have a tendency to see “costs” and “benefits” from an individual self- interested perspective or from a **variety of agency-interested perspectives.**

The agency perspectives are based on the specific organizational role of the government employee.

⁶ The seminal work is Dale Whittington; Duncan Mc Rae “The Issue of Standing in Cost-Benefit Analysis” *Journal of Policy Analysis and Management*, 5, n° 4, 1986, 665-682.

The two archetypal conservative perspectives are those of guardian, spender.

Take the case of **World Bank**, a major producer of CBA⁷ analysis.

Some authors criticize their partisan approach (N.Left 1985⁸)

Others underline the positive role of the WB (Devarajan S. ; Squire L. ; Suthivarat-Narueput, 1985)⁹.

6.1. The Guardian Perspective

Guardians view projects from a revenue-expenditure perspective (i.e. revenue inflows = “benefits”; expenditure outflows = “costs”).

They have a tendency to regard CBA as **naïve and impractical** and as a tool of spenders. Personnel in line agencies may vacillate between a spender and guardian perspective depending on the political and budgetary climate. Financial control personnel in line agencies tend to have a guardian perspective.

Some consequences of the guardian perspective:

- It downplays or ignores non-financial social benefits (time saved, lives, etc.) and costs (time spent, pollution).
- It interprets the meaning of “costs” idiosyncratically (and incorrectly!); e.g., regarding the cost of labor – guardians focus on actual wage remuneration, while CBA focuses on the opportunity cost of the labor).
- Resources owned by government tend to be viewed as free goods (rather than having an opportunity cost).
- It ignores those costs not borne by its own level of government.

⁷ You can find on line the World Bank, *Handbook on Economic Analysis of Investment Operations*. The World Bank, Operational Core Service Network, Learning and Leadership Center. 202p, 1998.

⁸ N.Left (1985)

⁹ Devarajan S. ; Squire L. ; Suthivarat-Narueput ; Reviving project appraisal of the World Bank, Policy Research Department, Public Economics Division ; août 1995.

- It treats subsidies from other levels of governments as “benefits” (they are a revenue inflow).
- It wants to use a high social discount rate – similar to a financial market discount rate (usually higher than the social discount rate).

6.2. The Spender Perspective

The spender perspective is usually found in service or line departments. Some consequences of the spender perspective are:

- **Expenditures on constituents are viewed as “benefits” rather than costs.**
- Transfers (from a CBA perspective) received by constituents are viewed as “benefits.”
- Some costs (such as workers’ wages) are viewed as benefits, this often means support for any project rather than a “do nothing” status quo.
- Utilized resources that are owned by government are viewed as having no cost.
- Large, capital-intensive projects with big sunk costs are favoured. They are harder to cancel later on.
- They tend to view market allocations as inappropriate, and do not accept that project resources are diverted from other productive uses.
- They favor low discount rates (because, holding everything else constant, this raises the *NPV*).

7 – CONCLUSION