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Public Management and Policy Analysis Program  
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**DCC5350 Public Policy Modeling**  
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Cost Benefit Analysis (CBA)

This document summarizes cost benefit analysis (CBA) in policy analysis and modeling.

## 1. Policy Analysis

A policy has the “if-then” form. A Shinkansen project says, for instance, “If government builds a new Shinkansen line, then Japanese economy will be revitalized.” But we don’t know exactly if the policy (a new Shinkansen line) can really achieve the designated goal (revitalized Japanese economy) in advance. Due to uncertainty and insufficient human knowledge, a policy cannot be accepted as correct a priori. “Policies are hypotheses” (Landau, 1977). Thus, we need to study if a policy is reasonable and plausible before making a decision. Policy analysis in this regard is a “search for error” to prevent potential errors and correct them.

“Policy analysis is an applied social science discipline which uses multiple methods of inquiry and argument to produce and transform policy-relevant information that may be utilized in political settings to resolve policy problems” (Dunn, 1981: ix). The “policy-relevant information” means causal relationship between policy alternatives and their goals, and costs/benefits of the alternatives.

“Policy analysis is client-oriented advice relevant to public decisions and informed by social values” (Weimer and Vining, 2011: 24). Policy analysis “must address the issue that the client poses” (p. 32). “Policy analysis is as much an art and a craft as a science” (p. 37).

An *ex post policy analysis* is post hoc or retrospective in that it describes and interprets past policies that were already implemented. An *ex post* analysis evaluates if a policy met its goals. By contrast, an *ex ante policy analysis* is pre hoc or prospective/predictive in that this analysis projects future states of a policy. A prescriptive policy analysis recommends a course of actions that is believed to bring about a desirable result.

## 2. Task of Policy Analysts (Weimer and Vining, 2011: 37-38).

“First, analysts must know how to gather, organize, and communicate information in situations in which deadlines are strict and access to relevant people is limited.” “They must be able to develop strategies for quickly understanding the nature of policy problems and the range of possible solutions.” Policy analysts “identify, at least qualitatively, the likely costs and benefits of alternative solutions and communicate these assessments to their clients.”

“Second, analysts need a perspective for putting perceived social problems in context.” “[T]he analyst needs a perspective that includes government failure as well as market failure.”

“Third, analysts need technical skills to enable them to predict better and to assess more confidently the consequences of alternative policies.”

“Fourth, analysts must have an understanding of political and organizational behavior in order to predict, and perhaps influence, the feasibility of adoption and the successful implementation of policies” (p. 38). “Analysts often face dilemmas when the private preferences and interests of their clients diverge substantially from their own perceptions of the public interest” (p.38).

“Finally, analysts should have an ethical framework that explicitly takes account of their relationships to clients” (p. 38).

### 3. Policy Analysis Tools

There are several analysis tools and approaches to produce costs and/or benefits of policy alternatives. These tools are not mutually exclusive.

- Cost benefit analysis/cost effectiveness analysis
- Policy modeling/management science/operations research
- Statistical and econometric analysis

### 4. Basics of Cost Benefit Analysis (CBA)<sup>1</sup>

CBA is “a decision aid used by policy-makers to determine whether public projects, programs, or policies should be undertaken (*ex ante* analysis), or to assess public programs retrospectively to determine whether they should be continued, expanded, or abandoned (*ex post* analysis).”

CBA features include “a systematic cataloguing of impacts as benefits (pros) and costs (cons), valuing in dollars (assigning weights), and then determining the *net benefits* of the proposal relative to the status quo...” (Boardman, Greenberg, Vining, and Weimer, 2011: 2). CBA considers *all of the cost and benefits to society as a whole*, that is, the *social costs* and the *social benefits* (p.2).

#### Terminology

- Baseline (oftentimes the status quo): “the project effects must be measured with reference (baseline) to a situation that would have existed in the absence of the project.”
- Stakeholders: “group of people potentially affected by the decision whose welfare matters to the decision-maker”
- Accounting domain: “a geographic zone that definitionally must encompass all stakeholders.” For instance, U.S.A., Niigata Prefecture, Minami Uonuma City, and IUJ.
- Costs (opportunity cost): “economic loss for that value of the foregone opportunity of using an input in the project” (money metric measurement)
- Benefits: economic value of output (money metric measurement)
- Financial transfer: “one-for-one monetary exchange between stakeholders” or “redistribution of value that the project produces”

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<sup>1</sup> Krutilla, Kerry. 2003. V541 Cost Benefit Analysis Lecture Notes.

## 5. Kaldor-Hicks Tableau

The categorical accounting approach focuses attention on inputs and outputs of a project, while Kaldor-Hick tableau approach focuses on impacted groups (stakeholders) and identifies winners or losers of the project. See the following tableau.

### A Cost Benefit Analysis of “Notice-and-Takedown” (Baseline: Section 230 Immunity)

	Stakeholders of an Imaginary Country				Net
	General Public	Offender (Bloggers)	Victim (Politicians)	ISP	
<b>Benefits</b>					
- Speech freedom	-30,000	-10			-30,010
- Privacy	-600		50		-550
- Censoring Tech.	30,900				30,900
<b>Transfer</b>					
- Compensation		-400	400		0
- Fee Increment	-300	-5	-2	307	0
<b>Costs</b>					
- Monitoring				500	500
- Litigation		150	100	50	300
- Penalty		200		250	450
Net	0	-765	348	-493	-910

\* Unit of measurement (currency) is Nyang whose exchange rate is completely unknown.

\*\* Krutilla, Kerry. 2005. Using the Kaldor-Hicks tableau format for cost-benefit analysis and policy evaluation. *Journal of Policy Analysis and Management* 24(4): 864-875.

In general, preferred policy alternatives are those whose overall net benefit is positive or larger, whose benefit/ cost ratio is greater than 1 (positive net benefit), and/or whose distributional issue is not serious (no substantial gap between winners or losers).

In the above CBA, the winner is the victim (politicians) and losers are offender (bloggers) and ISP. The “notice-and-takedown” policy (allowing the victim to ask ISP to remove offensive contents on the Internet) is predicted to result in negative net benefit (-910). More importantly, democratic value (freedom of speech and privacy) will be overlooked by the economic value (censoring technology and industry). Therefore, the policy is not preferred with respect to 1) low benefit/cost ratio, 2) serious distributional issue, and 3) social value.

## 6. CBA and Policy Modeling

The key issue is how to estimate individual costs and benefits of a project. Let us ignore net present value (NPV) calculation and contingent valuation here. In a complicated situation, estimation of costs and benefits will be challenging. We might ask experts their opinions and aggregate their subjective estimation, but this approach is not scientific. Policy modeling helps policy analysts estimate costs and/or benefits in logical and systematic ways. For instance, Linear Programming (LP) tells us predicted costs and benefits of an action taken by decision-makers. The objective estimation will be efficient and effective in negotiation of policy process.

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