Edited by
Anwar Shah

Policy, Program and Project Evaluation

A Toolkit for Economic Analysis in a Changing World

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Preface

In recent decades, evaluation as a discipline has progressed from a tool for post-evaluation to current operational management. Because of this, the evaluation techniques have come into widespread use both in public and private sector operations. The practice of this discipline has leapfrogged the available guidance from the existing literature creating a wide vacuum especially in evaluating the design and impact of policies, policy analysis, and advice. This book attempts to fill this void by providing a primer on both traditional and newer evaluation techniques. The book presents easily comprehensible and comprehensive tools of economic analysis that are currently used in the evaluation literature to evaluate public projects, programs, policies, and policy analysis and advice. It is hoped that the book would appeal to a wide range of readers interested in this subject such as scholars, researchers, students, evaluation professionals and practitioners, policymakers and public managers.

Washington, DC, USA — Anwar Shah

Acknowledgements

This project took a long time from inception to fruition. The editor is grateful to the authors for their patience and perseverance. Hopefully, their patience will be rewarded by the potential impact of this book in fostering the better design of public policies and programs globally to advance the public interest.

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Notes on Contributors

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Stuart Landon is Professor Emeritus of Economics at the University of Alberta, Canada. He holds degrees in economics from Queen's University (PhD), the University of British Columbia (MA) and McGill University (BA Honors), and has been a visiting academic at the Australian National University and Victoria University of Wellington. He has published papers on a wide variety of topics in Canadian, US, European and Australian economics and finance journals and was awarded the Canadian Economics Association's Vanderkamp Prize

(along with three coauthors) and the University of Alberta's Rutherford Award for Excellence in Undergraduate Teaching. He served in numerous administrative positions at the University of Alberta and co-chaired the working group that designed the new revenue allocation model for the University.

Melville McMillan is Professor Emeritus in the Department of Economics and a Fellow of the Institute of Public Economics at the University of Alberta, Canada. McMillan's research and teaching interests are in public economics, particularly urban and local economics, fiscal federalism, and the demand/supply of public goods and services. He has published in these areas and has advised governments and organizations nationally and internationally (e.g., the World Bank). Although "retired," McMillan remains actively involved in academic and policy matters.

Anwar Shah is Non-Resident Senior Fellow at the Brookings Institution, USA. He is also an advisor/consultant to the World Bank and Distinguished Visiting Professor of Economics at Southwestern University of Finance and Economics, China. He has previously served the World Bank, Government of Canada (Ministry of Finance), the Government of Alberta, and the UN Intergovernmental Panel on Climate Change. He has published more than two dozen books in English, Spanish, Chinese, Vietnamese and Russian languages and numerous articles in leading economic journals on governance, public management reforms, budget reform, federalism, local governance, fiscal reforms and global climate change issues.

Ewa Tomaszewska is Principal Economist at HDR, Canada. She has over 20 years of consulting experience in economic analysis of infrastructure projects, regulatory proposals, policies and programs for private and public sector clients in the United States and Canada. She has extensive experience across a wide range of economic assessments supporting client needs with a major focus on cost–benefit analysis studies to support applications for funding from higher-order governments, strategic planning and decisions, or regulatory submissions; economic and social impacts studies to support stakeholder and community relations; and economic policy research and analysis to inform and support strategic planning, policy decisions, and best practices development. Tomaszewska holds a PhD in Economics from the University of Alberta.

CHAPTER 1

Introduction

Anwar Shah

Evaluation as a discipline, in recent decades, has progressed from providing answers to questions like economic viability, cost-effectiveness, and efficiency to questions that are critical for effective planning, financing, design, implementation, and success of a program. Today evaluation can provide valuable assistance in defining a problem, identifying program targets, designing of interventions, identifying winners and losers and organizational strengths and weaknesses, assessing the quality of interventions and performance of program delivery and its impact, suggesting modifications and alterations, and ultimately guiding a program or project to its successful end. Evaluation is no longer just a tool for program or project appraisals but also an important tool in operational management. It is not just a snapshot of the end; it is also the means to the end (see also Williams and Giardina 1993). This book provides an easily comprehensible and comprehensive survey of tools of analysis that are used in the evaluation literature to evaluate public projects, programs, policies, and policy analysis and advice. The following paragraphs provide an overview of the book.

Chapter 2 by Deb and Shah provides a brief survey of the program evaluation methods, their objectives, strengths, and weaknesses. The

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methods have been presented in a manner that reflects the changes in outlook towards public programs and the changing role of evaluation. Accordingly, we have first presented methods like cost-benefit analysis, cost-effectiveness analysis, the social marginal cost of funds analysis, and data envelopment analysis that are appropriate for guiding efficient allocation and utilization of resources. This is followed by a discussion on multiple-objective evaluation, which is much more holistic. Apart from efficiency, it addresses issues like the relevance of a program, effectiveness of a program in achieving its objectives and sustainability of the program benefits. Newer multi-criteria approaches such as the Iron Triangle, Alternate Service Delivery Framework (ASDF), and the Results-Oriented Management and Evaluation (ROME) are briefly sketched. The Iron Triangle notes three important constraints faced by public managers—time, cost, and quality. The ASDF brings into sharper focus the role of government as a catalyst in managing and coordinating service delivery by government and beyond government providers. ROME is particularly noteworthy for recognizing the role of citizens as the principals and various orders of governments as their agents. It provides an integrated approach to managing for results, citizens-based evaluation of those results, and the processes to hold the government to account by citizens. Finally, the authors outline the theory-based evaluation approach. It is a relatively new concept in evaluation literature where the focus is not just on whether a program succeeds or fails but also on how and why a program succeeds or fails.

The chapter concludes that the methods discussed serve different purposes. Methods like cost-benefit analysis, cost-effectiveness analysis, and data envelopment analysis address the question of efficiency in the allocation and utilization of funds. In multiple-objective evaluation, the emphasis is more on accountability in public sector programs, the effectiveness of programs, and the sustainability of program benefits. The evaluation is concerned with issues like identification of program beneficiaries, assessing their requirements, tailoring of interventions to meet those requirements, monitoring of interventions to ensure that the appropriate interventions are being delivered to the participants, and finally the overall effectiveness of the interventions in achieving the program objectives. So, a multiple-objectives evaluation plays a big role in program planning, design, and implementation. A theory-based evaluation assigns an even bigger role to an evaluation in public programs. It goes deeper into the mechanism through which the interventions bring about the desired effects. It

analyzes the causal links between interventions and outcomes. So, instead of passing a summative judgment on whether a program succeeded or failed in achieving its objectives, the theory-based evaluation shows *why* it succeeded or failed. Thus, it contributes to the development of more effective programs in the future.

The authors argue that evaluation is different from other social research in the sense that it derives its questions from policymakers, program sponsors, program managers, and stakeholders. So, the applicability of any specific evaluation method depends on the questions that the evaluator has been asked to address. When the evaluation question is deciding upon alternative interventions aimed at producing similar effects, cost-effectiveness analysis might be more suitable. But it is not useful at all when the problem is prioritizing among different programs addressing different problems. A cost-benefit analysis will be more appropriate in that case. Similarly, data envelopment analysis might not have the valuation problems associated with the cost-benefit or cost-effectiveness analysis. But its applicability is limited to comparing efficiencies of similar programs only. For programs whose efficacies have already been established, multiple objective evaluations might be enough for performance evaluations. However, for pilot studies or for programs that have not been tested before, a theory-based evaluation is much more desirable. But it is also more time consuming and more expensive than any other evaluation methods. So, the choice of the evaluation method would also depend upon the availability of time and resources.

Chapter 3 by Robin Boadway summarizes the principles used to evaluate projects (such as individual investment projects, general expenditure programs, and the implementation of government policies) from an economic point of view. Following the principles of welfare economics, the objective of project evaluation is to measure the costs and benefits to individuals in society. The chapter begins with some theoretical perspectives on cost-benefit analysis and then proceeds to discuss the difficulties of implementing such an analysis and practical ways of dealing with these problems. He describes project evaluation as "an art, though one with scientific underpinnings."

Broadly, the measurement of costs and benefits amounts to a measurement of individuals' "willingness to pay." Two methods that have been developed in the theoretical literature are "compensating variation" and "equivalent variation," depending on whether one wishes to use final or initial prices (respectively) for goods affected by the project. In addition,

one must consider that projects that have costs and benefits spread over time must use a common set of prices to adjust for inflation and the time value of money. Policymakers may also wish to add distributive weights—in other words weighting more heavily improvements in the incomes of the poorest. Once the discounted stream of costs and benefits is summed (yielding the Net Present Value, or NPV), the decision rule for project approval is simply determined by a (positive) sign of the NPV. Finally, the risk and uncertainty of outcomes should also be included. Other, similar techniques for project evaluation include the benefit-cost ratio and the internal rate of return methods. However, these alternative measures have some problems and may rank projects differently than the NPV criterion.

While the NPV method is in principle the same as is used by the private sector to guide the choice of investment decisions, the implementation of this procedure differs in some important ways when applied to the public sector. This is because the public sector must take into consideration: the marginal social values or shadow prices (rather than just market prices, since markets may be distorted) of inputs including labor, capital, and foreign exchange, and the impact of externalities such as pollution, general equilibrium effects of the project, valuation of intangible benefits and costs (such as time saved due to public transport), excess burden of public financing (due to distortions of the tax system—the so-called marginal cost of public funds, or MCF), the social discount rate, and social considerations (such as equity or protection of special groups). Each of these issues is considered in turn in this chapter.

Chapter 4 by Bev Dahlby probes more deeply into an evaluation tool that received brief treatment in Chaps. 1 and 2—the Marginal Cost of Public Funds (MCF), or the loss to consumers and producers caused by raising an additional dollar of tax revenue. Taxes impose a cost on the economy if they alter taxpayers' consumption, production, and asset allocation decisions, leading to a less-efficient allocation of resources. Raising an additional dollar of tax revenue costs the private sector more than a dollar if the allocation of resources in the economy becomes more distorted. The marginal cost of public funds, MCF, is a measure of the cost imposed on the private sector in raising an additional dollar of tax revenue. Dahlby argues that the marginal cost of public funds should be used in evaluating the opportunity cost of financing public sector expenditures. It also provides a guide for tax reform by revealing which taxes impose the greatest welfare losses in generating additional revenues. The MCF can

also be used to measure the gains from tax reforms that shift the burden from the high-cost tax bases to ones with lower costs.

In this chapter, Dahlby introduces the concept of the marginal cost of public funds (MCF), examples of how the MCFs can be measured, and examples of how they can be applied to guide tax reform and public expenditure policies. In keeping with the theme of this volume, the emphasis is on using the MCF as a tool for public policy analysis. Two practical examples demonstrate the use of this evaluation tool in public policy analysis and evaluation. The first is an assessment of the gains from a tax reform that shifts some of the tax burdens from corporate to the personal income tax base in Alberta, Canada. The second example illustrates how the MCF can be used to derive optimal matching rates for intergovernmental infrastructure grants in a federation. In presenting these applications, the author makes a convincing case of the critical importance of the MCF as a tool for the evaluation of tax and expenditure policies.

Theory-based evaluation traces the factors that contributed to a specific outcome for the project. This a challenging task for project evaluation as it requires establishing a causal chain based upon theoretical considerations and analyzing data on various links in this causal chain. Ewa Tomaszewska in Chap. 5 provides a guidebook for those interested in conducting case studies in project evaluation determining the impact of various projects in combating corruption. The author provides a conceptual framework and data requirements for such evaluation case studies for privation programs, judicial and legal reforms, civil service reforms, trade liberalization, tax administration reforms, and direct anticorruption activities (anti-corruption agencies), the Office of Ombudsman, transparency rules and decentralization.

The impact of corruption on public service delivery performance and poverty alleviation is widely recognized. A wide consensus has also recently emerged that corruption is a symptom of failed governance and hence curtailing corruption requires addressing the causes of misgovernance. Nevertheless, the menu of potential actions to curtail corruption is very large so a framework is needed that provides guidance on ordering potential actions. Prioritization of various actions depends on both the conceptual and empirical views of what works and what does not work in the context of particular countries. Such a framework is also needed for evaluating country anti-corruption programs and policies. Chapter 6 by Huther and Shah proposes a framework for such evaluations. The chapter

concludes that path dependency is critical in determining the relative efficacy of various anti-corruption programs. For example, in a largely corruption-free environment, anti-corruption agencies, ethics offices, and ombudsmen serve to enhance the standards of accountability. In countries with endemic corruption, the same institutions serve a function in form only and not in substance. Under a best-case scenario, these institutions might be helpful, but the more likely outcome is that they help to preserve the existing system of social injustice. Successful anti-corruption programs are those which address the underlying governance failures, resulting in lower opportunities for gain and a greater likelihood of sanctions. Thus, programs must be targeted to a country's existing quality of governance. Past experiences of the industrialized world confirm these conclusions since, without exception, these countries did not achieve a reduction in corruption by introducing technocratic solutions but, rather, by encouraging a sense of public duty among officials through accountability for results. Such an accountability culture came about by empowering people and by decentralizing decision making. These conclusions suggest the following stylized presentation of anti-corruption measures based on the existing quality of governance. Addressing the governance failures which distort officials' cost-benefit assessment is likely to be the only route to success in countries with high levels of corruption and poor governance since direct dialogue on corruption is likely to be counter-productive (resulting in simply another level of corrupt officials under the name of anti-corruption offices). In countries with poor governance quality, external advice can promote economic liberalization, judicial reform, and greater public participation in public expenditure decisions without explicitly raising contentious issues of corruption and, one hopes, without threatening their existing relationships. In countries with modest levels of corruption and governance quality, where the existing governance structure has the capacity to reform, it is an important focus on improvements in readily identifiable output indicators rather than uncertain measures of corruption as measures of success. In countries with high governance quality, explicit efforts to reduce corruption are likely to be successful—commissions on corruption, ombudsmen, ethics offices, and the like can rely on an infrastructure of public accountability and transparency to ensure that their findings result in lower incentives to commit corrupt acts.

Public Expenditure Review (PER) is a widely used tool by the development assistance community to develop advice on budgetary institutions and allocations. This tool has also been used by both industrial and

developing countries as an aid to public sector reforms. The most common format of PERs begins with a presentation of an overall picture of the country's fiscal situation. This picture typically focuses on the country's expenditure trends. This presentation provides the background, and frequently the justification, for the specific issues addressed by the review. The picture of the fiscal situation is frequently followed by an analysis of the budget process which typically provides the foil for recommendations made in the PER. In some cases, providing a picture of the country's fiscal situation and outlining the budget process may be the only tasks undertaken in the PER. In other cases, PERs review selected inter- and intrasectoral issues. Almost all formal, and many informal, reviews also include extensive data on a country's expenditures. Chapter 7 by Huther and Shah presents a framework for evaluating the quality and timeliness of PERs as well as conducting a review of their impact. They highlight specific elements to consider and to rate in such an analysis and how to develop final cost-efficiency and benefit-cost ratings.

Given that the empirical evidence on the relationship between government expenditures and economic growth is inconclusive, Stuart Landon in Chap. 8 asks if the composition of expenditures and design of programs is a better determinant of the effectiveness of government expenditures than the size of the public sector. Although there are no universal rules, he suggests that a review of the empirical evidence drawn from a broad number of countries can help to identify the sectors that should generally receive the highest priority in government budgets.

In theory, government intervention can improve welfare in the presence of market failure (such as insufficient competition and incomplete markets arising from public goods and asymmetric information). However, the nature and magnitude of the market failure must be known when designing the program to ensure that the costs of intervention are justified and that the government has the capacity to successfully carry it out. In states with weak capacity, government intervention may be more harmful than the market failure that the program was intended to address. Given that state capacity is a critical input for the successful implementation of government programs (and therefore the effectiveness of public expenditures generally), it is worthwhile to invest in the capacity of public administration and reduce the size while improving the quality of the civil service (though this may be politically difficult) and developing a system to monitor expenditure effectiveness. Incentives for improved public sector performance may be created by increasing wages and reducing wage

compression when coupled with mechanisms that create accountability for performance. Other tools for improving the public sector include subjecting the public sector to greater competition, involving the private sector for provision, implementing user fees.

Landon also deals with sector-specific issues, including law and security, military spending, infrastructure, transportation, operation and maintenance expenditures, education, health, redistribution, regulation, financial markets, state-owned enterprises, and industrial subsidies. For each of these, he discusses whether the sector should be a priority in the public budget as well as ways to make expenditures in each area more effective. He also considers the efficiency and equity effects of expenditures in addition to the likely re-distributional consequences. Based on a review of the literature, Landon assigns a low priority to subsidies to many state-owned enterprises and private industry, poorly targeted consumption subsidies, infrastructure that could be undertaken by the private sector, social security programs, tertiary education and hospital care, military spending, and extensive regulatory regimes. High priority should be assigned to develop an effective legal system to protect and enforce property rights, effective financial regulation, maintenance of existing infrastructure, and transportation, communications, and electricity infrastructure. Spending priority should also be given to improvements in the quality and quantity of primary education and basic health care, water and sanitation, and well-targeted consumption subsidy programs for the very poor.

Governments are becoming more decentralized. Political power and public decision making in many countries around the world have, to varying degrees, shifted away from central governments, particularly over the past quarter-century. This movement has been attributed to various forces; for example, the growing number of democracies, urbanization, increasing literacy, rising incomes, a growing middle class, and the failures of central governments. The World Bank has been involved in this transition in developing countries. Given the extent of the movement occurring and the Bank's initiatives, there is a natural wish to assess the Bank's activities regarding decentralization. A comprehensive evaluation of the Bank's undertakings in this area creates the opportunity to understand better the potential for and limitations of decentralization, to identify the strengths and weaknesses of Bank activities and practices relating to decentralization, and to assist in refining Bank policies concerning decentralization. Essentially, an evaluation is to generate information that will help the Bank's decentralization policies, programs, and practices to be more

successful. Chapter 9 by McMillan outlines an approach in evaluating the Bank's decentralization initiatives. The basic methodology for evaluating individual decentralization projects is outlined with elaboration components of decentralization and steps to be taken in the evaluation. The method for extending the evaluation across many projects follows. The problem of selecting or sampling the projects to be evaluated is discussed. Special treatment is given to projects on community-driven development. The chapter also presents thoughts on bringing the various analyses and the analysis of a rather diverse set of projects together and putting the results into perspective.

Chapter 10 by Shah evaluates the conditionality of development assistance in terms of its intended and unintended consequences. Development assistance is motivated by altruistic, economic, political, military, and humanitarian considerations. It is used to advance wide-ranging objectives such as minimizing risks for loan repayment, efficiency, equity of the public sector, overcoming infrastructure deficiencies, promoting growth, facilitating poverty alleviation and good governance, combating terrorism, support for a specific ideology, influence peddling, and economic and political imperialism. The provision of such assistance is often conditional as even unconditional assistance almost always carries some explicit preconditions and implicit conditions. Conditions are imposed as part of lending or grant assistance unilaterally or by mutual agreement of the donor and the recipient. These conditions form the contractual terms of such assistance which bind the recipient to expected actions or results as a quid pro quo for receiving such financial assistance. These conditions can vary from being very vague to extremely clear and precise. They may impose formal binding requirements or simply indicate informal nonbinding expectations. The chapter provides conceptual perspectives from game theory, public choice, fiscal federalism, political economy, new institutional economics, and New Public Management literature on the design of external assistance and its potential impacts. It shows how the neglect of these conceptual considerations can result in a lack of effectiveness of aid conditionality and waste of such assistance. It provides an overview of the historical evolution of perspectives on donor-recipient relations and on the conditionality of external assistance. It highlights the developing consensus by the development assistance community on both the instruments of development finance and associated conditions. It also briefly notes progress, or lack thereof, for practice to conform to emerging consensus. It cites examples where the inappropriate design of conditionality led to

adverse consequences for project and program outcomes. The chapter provides lessons on major issues in the conditionality of development assistance.

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CHAPTER 2

A Primer on Public Sector Evaluations

Saubhik Deb and Anwar Shah

Introduction

Program evaluation has undergone major changes over the years at both a conceptual and a functional level. It has transformed from a tool designed mainly to assess the efficient allocation of resources to a full-grown discipline concerned with the all-round development of a program. The multitude of social and economic problems and the constraint on available resources require prioritization among both problems and programs directed at addressing those problems. As a result, assessment of the cost efficiency of public interventions still occupies a prominent role in evaluation research. However, a heightened awareness of the potentials and perils of public problems both at the national and international arena and the need for proactive measures have brought forth issues like efficacy and accountability in the parlance of program evaluation. Consequently, evaluation as a discipline has transgressed from providing answers to questions like economic viability and efficiency to questions that are critical for effective planning, design, implementation, and success of a program. Today evaluation can provide valuable assistance in defining a problem,

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identifying program targets, designing interventions, identifying organizational strengths and weaknesses, assessing the quality of interventions and performance of program delivery, suggesting modifications and alterations and ultimately guiding a program to its successful end. Evaluation is no longer just a tool for program appraisals or a snapshot of the end of a project or program. It also serves as a means to an end.

This chapter provides a brief survey of the program evaluation methods, their objectives, strengths, and weaknesses. The methods have been presented in a manner that reflects the changes in outlook towards public programs and the changing role of evaluation. Accordingly, we have first presented methods like cost-benefit analysis, cost-effectiveness analysis, the social marginal cost of funds analysis, and data envelopment analysis that are appropriate for guiding efficient allocation and utilization of resources. This is followed by a discussion on multi-criteria or multiple-objectives evaluation (MCE/MOE), which is much more holistic in nature. Apart from efficiency, it addresses issues like the relevance of a program, effectiveness of a program in achieving its objectives and sustainability of the program benefits. Newer approaches such as the Iron Triangle, Alternate Service Delivery Framework, and the Results-Oriented Management and Evaluation (ROME) are briefly sketched. Finally, we discuss theory-based evaluation. It is a relatively new concept in evaluation literature where the focus is not just on whether or not a program succeeds or fails but also on how and why a program succeeds or fails. This is followed by the conclusion. An annex to this chapter provides a brief overview of the evaluation approach used by the World Bank.

Leading Approaches to Evaluation

In the following sub-sections, leading approaches to public sector evaluations are highlighted.

Cost-Benefit Analysis

Cost-benefit analysis is one of the earliest methods of program evaluation. It analyzes the economic viability of programs by comparing their total benefits with the total costs. When resources are limited and different programs need to be pitted against one another for allocation of funds, cost-benefit analysis can be used for prioritization of programs based on their net worth.

Cost-benefit analysis estimates the net present value of a program by comparing the benefits of the program with the associated costs. The notion of benefits and costs typically depends on the evaluation perspective. Costs and benefits calculated from program sponsors' perspective would be very different from those calculated from the perspective of program beneficiaries and would lead to very different conclusions regarding feasibility of programs. For public sector projects, cost-benefit analysis should be conducted from a social perspective. In other words, all costs and benefits for the community or the society as a whole should be taken into consideration rather than restricting attention to program beneficiaries only. Such benefits and costs can be both direct and indirect. For example, in an irrigation project, the direct costs are the capital and operational costs of the project and the compensation costs for the loss of land due to construction or inundation. The direct benefits are regeneration of degraded lands, enhanced crop yields, higher agricultural income and employment, a decline in the variability of agricultural production and increased sense of livelihood security. The indirect benefits include employment generation for the irrigation project and improvement in the quality of life, whereas indirect costs might include the loss in bio-diversity and the sufferings of people displaced from their lands.

The analysis requires determination of the length of the program—the number of years over which benefits and costs of the program are to be evaluated. Monetary values are then assigned to all benefits and costs. Since benefits and costs materialize over different periods, for comparison purpose, all current and future streams of benefits and costs are converted to their present values by using an appropriate discount factor. Net present value of a program is calculated as the difference between the present value of its benefits and the present value of its costs. A program is feasible only when its net present value is positive. Net present value can be used as a criterion for allocating funds among competing programs. Alternatively, benefit-cost ratios can also be used. Benefit-cost ratio is the ratio of present value of benefits to present value of costs. However, for mutually exclusive programs where implementation of one program precludes the possibility of others, the comparison of programs based on benefit-cost ratios can be misleading. In those cases, net present value should be used instead.

One of the important aspects of social cost-benefit analysis is the choice of the appropriate discount rate (Department of Finance 1987). The discount rate reflects the opportunity cost of capital (the rate of return that

could have been earned through alternative investment of the funds). For public programs, the interest rate on government borrowing can be used for discounting future benefits and costs. However, if public investment displaces private investment, such an interest rate will not reflect the true opportunity cost of capital. In that case, the appropriate discount rate should be the social opportunity cost rate. The social opportunity cost rate is the return on private sector investment that has been displaced by the public project. Another alternative is to use the social time preference rate. It represents society's preference between current and future consumption. Social time preference rate is the required additional future consumption that is necessary to compensate for the loss of one unit of present consumption. Unfortunately, there is no authoritative way of choosing a discount rate. But the outcome of the cost-benefit analysis crucially depends on the choice of the discount rate. A lower discount rate puts relatively more emphasis on future costs and benefits whereas a higher discount rate puts more emphasis on short-term benefits and costs. Accordingly, as the discount rate increases, the net present value of a project decreases. So, depending on the choice of the discount rate, the net present value of a project can be positive or negative, thereby making or breaking the project. A sensitivity analysis (i.e., repeating the same cost-benefit analysis for different discount rates) is required for checking the robustness of results. Alternatively, the internal rate of return (IRR) of a project can be reported. IRR is the discount rate at which the net present value of a program is zero. So, it gives the decision makers a measure of risk associated with the project. However, IRR is not a criterion for program selection.

Another important aspect of cost-benefit analysis is the estimation and valuation of social benefits and costs. The analysis involves the estimation of incremental benefits and incremental costs that can be assigned solely to the project. So it is important to construct the counterfactual, i.e., what would happen or would have happened without the project. Incremental values can then be calculated by comparing the benefits and costs with and without the project. In *ex post* analysis, the problem is constructing the counterfactual. For *ex ante* analysis, the problem is not only constructing the counterfactual but also forecasting the expected benefits and costs of the project. So, there is a certain amount of uncertainty involved in the estimation of benefits and costs. Once the benefits and costs have been estimated, the next step is to assign monetary values by using prices that would reflect their true opportunity costs. When markets are perfectly