

CHAPTER 4

ASSESSING THE EFFECTS OF POLICY CHANGE

- | Assessing the Effects of Policy Change
- | Approaches to Analysis

A. Introduction

The starting point for any assessment of policy change is the status quo or the “without program” situation. Ideally, much of the framework and data for this assessment should have been collected as part of sector work and related analysis. With the status quo as the reference point, conceptually, reform measures are similar to project activities in an investment project (Squire 1989). In addition, reform measures lead to an output, such as in a new law, in support of desired outcomes. So, the underlying input-output relationship becomes the conceptual framework for identifying and valuing the benefit and cost streams of policy operations, as in projects.¹³ OED’s Special Evaluation Study on Program Lending (ADB 2001, paragraph 77) notes: “Program design seems to begin with the proposed reforms, derived from international practice, with sector analysis and expected benefits as justification.” This finding calls for efforts to refine and further develop the conceptual and analytical framework for undertaking ex-ante economic analysis of policy and institutional reforms.

Kanbur (1990) notes, in reference to World Bank experience, that many commentators have claimed that it is difficult to carry out economic analysis for policy operations.¹⁴ The same is often heard with regard to ADB program

loans. However, such claims are questionable because when proposing a policy reform measure as part of the program design, an opinion has already been expressed—however implicitly—about the expected linkage between the reform measures and their benefits. For example, a road investment project proposal to rehabilitate a length of highway implies an underlying assessment of the relative priority and the incremental benefits that such an investment should generate, including a justification for the investment as a means of allocating scarce resources toward some welfare objective.

Seen in this light, the problem is not about whether it is possible to perform economic analysis on policy reforms. It centers on how such analysis can be done, or the issue of the analytical framework and specific methods to be used. To make effective use of a defined analytical approach involves setting up valid and verifiable assumptions. In the context of project design, the economic analysis entails developing valid and verifiable assumptions of certain input and output relationships relevant to a project. In the context of policy reform, formulating valid and verifiable assumptions is an even more critical part of the economic analysis.¹⁵ This endorses the need for solid sector analysis that provides the basis to

¹³ Chapter 7.D further discusses this relationship, and Figure 8 offers a schematic of it.

¹⁴ See also Ali (1990).

¹⁵ Kanbur (1990) and Ali (1990) show in a stylized fashion how project economic analytics can be applied to analyzing policy reforms, referring to price policy reforms. In fact, in the literature of public economics, any policy or project variable can be chosen as endogenous to see the change in welfare level with respect to a marginal change in the chosen variable within the same analytical model.

validate the assumptions that underlie effective reform. A further analytical challenge is to apply the framework in assessing institutional reforms.

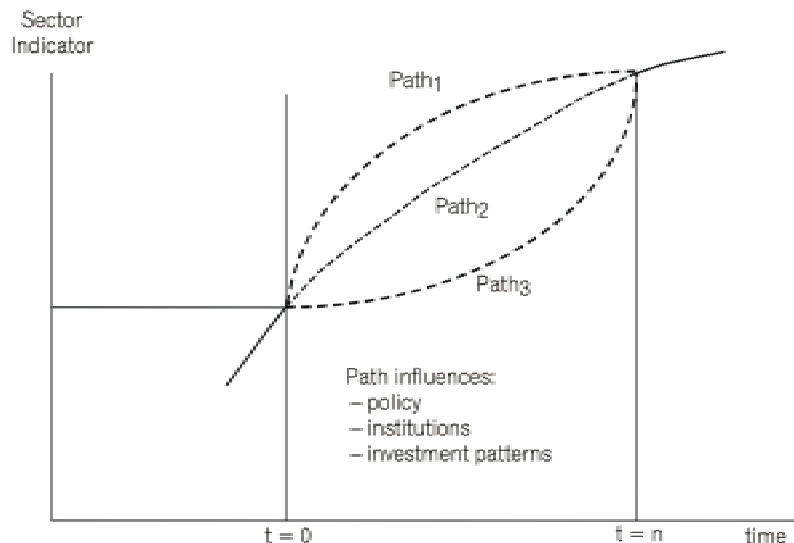
B. Assessing the Effects of Policy Change

Once a policy problem is identified through diagnostic sector work, the next step is to determine alternative solutions and predict their possible outcomes. Ideally, policy options should be subject to simulations of possible outcomes in order to assess their possible impact on, for example, sector performance. Such simulations would also assist governments and stakeholders in determining alternative paths and approaches to improving performance and selecting from these paths. Given the possible mixes of reforms and investments, several paths

can be taken. Figure 3 shows this conceptually, with t_0 representing the current sector performance and t_n performance after implementation. The task of policy analysts is to assess and present viable options to governments and stakeholders to facilitate selection of the least-cost and best sequenced mix.

Short-run negative consequences can arise as part of the policy reform process. For example, expenditure reduction programs may constrain government expenditure and the delivery of services, or resource immobility may hamper efficiency gains from price liberalization in the short run. A priori, a range of reform measures could have negative short-run consequences for certain stakeholders in the absence of explicit mitigatory interventions in the form of compensatory mechanisms and social

FIGURE 3: Different Reform Scenarios to Meet a Policy Goal



Source: EREA staff, Asian Development Bank.

safety nets. Despite the potentially beneficial longer-term consequences of these reform measures for even short-term “losers,” the short-run negative consequences cannot be neglected. This was one of the early lessons of structural adjustment lending in the 1980s and 1990s. It retains its relevance today with recent reforms that increasingly focus on institutions. Figures 4 and 5 depict profiles in terms of without adjustment, with adjustment, and the “no shock” situation based on a five-sector computable general equilibrium model for Ecuador in the late 1980s (de Janvry, Fargeix, and Sadoulet [1990] reported in Kanbur [1990]).

To the extent possible, policy analysis, including simulations, should be carried out to identify the short- and medium-run effects. However, *ex-ante* assessments of policy options are often based on hypotheses drawn from a priori reasoning that should, in principle, be subjected to empirical verification, rather than be accepted as statements of fact. Given the nature of some reform measures, this can be challenging. For example, improving the “enabling environment” is often used as an argument for policy reform. Among the ADB program loan reports reviewed (Appendix I), a strong case is usually made for reforms and often an intuitive “with-without” comparison can be instructive. For example, the Kazakhstan pensions system must be reformed to avoid collapse; the Federated States of Micronesia (FSM) must rapidly develop the private sector to compensate for the shrinkage of the public sector as Compact of Free Association funding is reduced; financially distressed SOEs

in Viet Nam need urgent restructuring and, where possible, privatization; and financial sector development in economies, such as Mongolia and Viet Nam is a necessary, even if not sufficient, condition for accelerated and sustained economic growth and poverty reduction. Where a priori reasoning cannot be verified and intuition must be relied upon to facilitate close monitoring, the analytical limitations should be acknowledged, and the assumptions on probable response and expected outcomes should be stated.

C. Approaches to Analysis

Sector-wide and loan-specific studies can potentially employ a full range of macro-, meso-, and micro-analysis techniques that could shed light on the possible effects of a given policy change. As described in Evans (1999), analysis can range from economic modeling and full quantitative analysis, to historical and qualitative analysis, to cross-country comparisons and direct country estimates, and the “checkable story” fallback, including rapid appraisal techniques. The limitations of these progressively less rigorous techniques are discussed in Evans (1999).¹⁶ For example, where analysis of feedback effects is desirable, general equilibrium analysis is appropriate. Comparative static analysis, using partial equilibrium techniques, allows analysts to see the effects of, for example, a price change (including taxes and subsidies) or quota change on supply and demand of a commodity. Examination of descriptive statistics and ad hoc calculations provide insights into available secondary data, but amount to a qualitative assessment.

FIGURE 4: Alternative Real GDP Scenarios

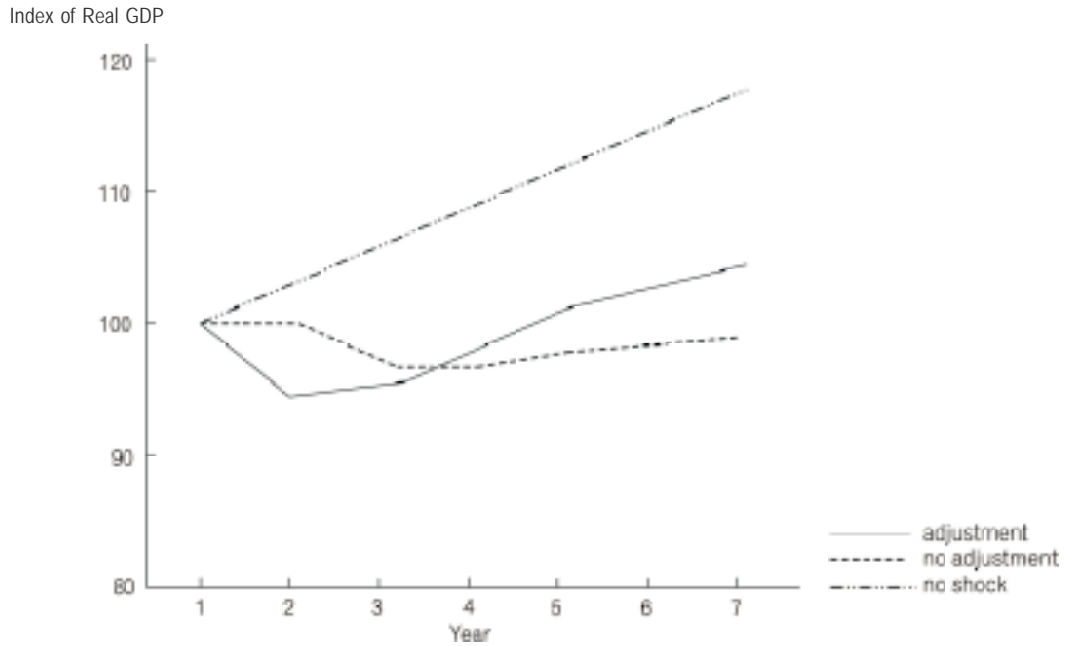
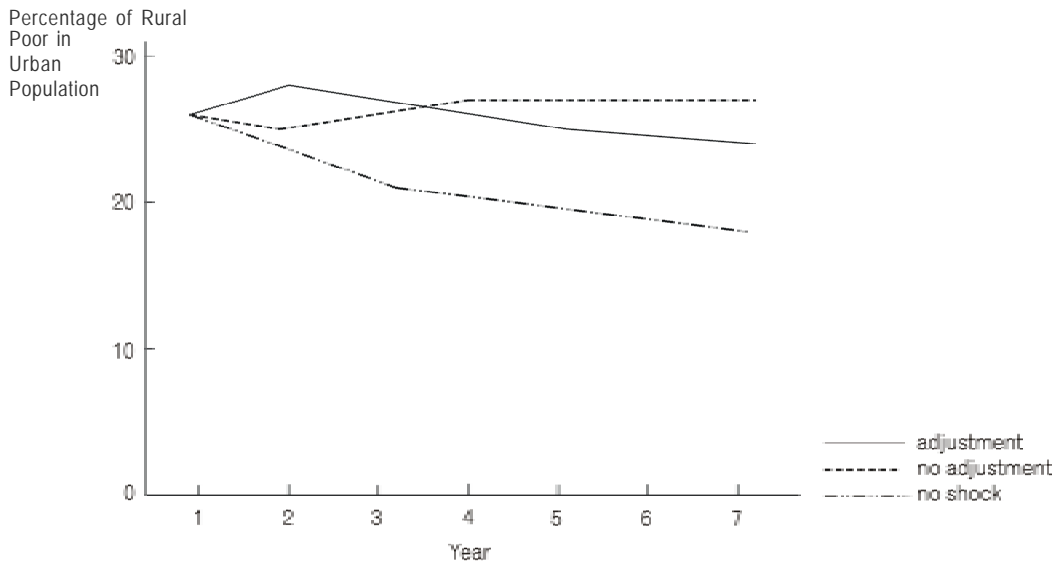


FIGURE 5: Alternative Rural Poverty Scenarios



Source: de Janvry, Fargeix, and Sadoulet. 1990. *The Political Economy of Stabilization Programs: Growth, Welfare, and Sustainability*. Department of Economics, University of California, Berkeley. Reported in R. Kanbur. 1990. Projects versus Policy Reform. Paper presented at the World Bank Annual Conference on Development Economics, Washington, DC.

The World Bank (2002b) provides a useful framework to help the analyst in selecting the appropriate approach and tool for analyzing the effects of changes. The framework considers two key dimensions: the importance of feedback effects in the reform measures, and data availability and analytical capacity (Table 6). In cases where the policy reform is likely to lead to high feedback, with significant multiplier effects transmitted through a number of channels and markets lagged over time, the effects will need to be estimated. Examples of reforms with high feedback effects include monetary and fiscal policy changes that affect inflation, interest rates, balance of payments and reserves, fiscal deficits, trade and exchange rates (removal of tariffs and exchange rate policy), and financial

sector reforms. Reforms that are less likely to have feedback effects include narrowly focused public sector institutional reforms, such as civil service reforms, land reforms, privatization of SOEs, and labor market reforms.

The main messages emerging from Table 6 are as follows:

- Reliance on qualitative assessments results in non-parametric analysis and does not permit order of magnitude impact assessment projections. The greater the quantitative and parametric analysis, the greater the possibility of identifying the magnitude of outcomes and predictions.
- As a minimum, descriptive statistical analysis is required to provide an order of magnitude assessment of the

TABLE 6: Selection of Techniques for Policy Change Impact Analysis

		Data and Analytical Requirement		
		Low	Medium	High
Accommodation of Feedback Effects	L o w	<ul style="list-style-type: none"> • Descriptive statistical analysis and economic and social characterization • Qualitative impact assessments with specified assumptions • Use of secondary sources of analysis with clear assumptions 	<ul style="list-style-type: none"> • Partial equilibrium analysis of prices, supply, and demand parameters • Budget analysis • Benefit incidence analysis • Partial equilibrium analysis of price policy • Affordability and willingness-to-pay analysis 	<ul style="list-style-type: none"> • Survey-based household models • Full econometric demand and supply analysis • Fiscal impact and public expenditure analysis • Comparative institutional analysis/transaction cost analysis
	H i g h	<ul style="list-style-type: none"> • Qualitative impact assessments of inter-temporal and distribution effects • Descriptive statistical analysis 	<ul style="list-style-type: none"> • Multi-market analysis • Reduced form input/output analysis and simulation models 	<ul style="list-style-type: none"> • Social accounting matrixes—input/output analysis • Computable general equilibrium

Source: Adapted from "A User's Guide to Poverty and Social Impact Analysis." Draft. 2002. World Bank Poverty Reduction Group and Social Development Department, 19 April 2002.

¹⁶ A summary of Evans' suggestions is also provided in Bolt and Fujimura (2002).

economic and social situation as a starting point for assessing possible impacts.

- Where qualitative assessments and a priori reasoning are to be relied upon, then the limits of the analysis and the underlying assumptions should be clearly stated.
- The initial descriptive work and the nature of the policy change will provide guidance as to whether there will likely be significant feedback effects that will guide further analyses, especially the sufficiency for partial equilibrium analysis or the need for general equilibrium analysis.
- Increasingly rigorous analytical techniques require greater use of data, resources (analyst time and funding for field and office work), and capacity.

The rest of this chapter outlines the basic features of these analytical techniques and limitations, and references to their application in ADB policy operations.

1. Descriptive Statistical Analysis (Cases 2 and 3 in Appendix 3)

Where neither general nor partial equilibrium modeling is possible, then reform impacts will have to be assessed with simpler descriptive statistical analysis and ad hoc calculations and methods for possible effects prediction. These could involve, for example, estimates of the price effects of particular interventions and estimates of their impacts on consumers and producers on the basis of simple demand and supply elasticities. Such elasticities can be derived econometrically, but in simpler calculations,

they can be taken from other studies or simply assumed.

Case 2 in Appendix 3 (Philippines Power Sector Restructuring Program) illustrates the approach to estimating changes in economic subsidies accruing to a particular consumer group such as the poor. This approach is also useful for assessing the impact of social sector programs, as in health or education, which involve the introduction of, or increase in, user charges, or the expansion of private sector provision. Another useful exercise is a budget impact analysis. This has little economic modeling behind it, but is easy to apply to a package of fiscal reform measures that are a usual feature of sector reforms. Case 3 in Appendix 3 provides an application to the Uzbekistan Education Sector Development Program.¹⁷

2. Partial Equilibrium Analysis: Market and Price Analysis (Cases 1 and 4 in Appendix 3)

Partial equilibrium modeling is a more formal analytical technique where one market or sector is looked at alone, without allowance for feedback to other parts of the economy. “Static” analysis either assumes low feedback effects or ignores effects in other markets and industries, so is appropriate in analyzing changes brought about by price policy changes that have limited impacts on economy-wide aggregates. Applications include, for example, enterprise budget effects and competitiveness issues, as well as situations of low data availability

¹⁷ The linkage between policy change and fiscal impact is further discussed in Chapter 6.

and capacity. Case 1 in Appendix 3 provides an application of a simple partial equilibrium analysis to the FSM, which was found to be practical during ADB policy dialogue with government officials on the appropriateness of subsidizing efforts to establish a poultry industry.

Another illustration is provided in the supporting analysis for the Philippines Grains Sector Development Program (DAI Consultants 1998). This program has several policy reform menus but the element modeled covers the reform of the rice market and pricing policy of the National Food Authority. Case 4 in Appendix 3 gives the structure of the model and shows how it was used to assess the effect of a policy change. Using the same reform program, further extension of the rice market analysis to an agency cost analysis was undertaken by combining the organizational costs and market inefficiency costs. Partial equilibrium modeling of this type is useful in situations in which key prices relevant to the assessment of reform impact are best treated as endogenously determined, rather than as exogenous parameters. For example, in the Grains Sector Development Program, the price of paddy received by farmers and the price of rice paid by consumers are critical variables. The model allows prices to be determined by domestic demand and supply conditions, allowing an assessment of how they vary with the assumed impact of reforms.

However, in an ex-post examination of the costs and benefits of price policy reforms based on a case study in the

cashew nut sector in Mozambique (McMillan, Rodrik, and Horn Welch 2002), caution is suggested on basing price policy reform entirely on an analysis of the likely response to supply from price liberalization. This is especially the case where “a priori generalizations” are relied upon as the basis for assessing the expected efficiency gains and what eventually proved to be overstated benefits. It became apparent that consideration of the Government’s level of commitment to the reforms and identification of the level of political opposition were both inadequate. There had been a failure to consider compensation for redundant processing laborers; to introduce a “credibility enhancing mechanism” for the reforms; and to generate public awareness. This failure led to low expectations by processors and their laborers, traders, and farmers that the reforms would hold. Processing laborers did not find new employment because they anticipated that the Government would backtrack on the reforms, and traders captured a good part of the price benefits intended for poor cashew farmers. Clearly then, in cases where key stakeholders’ expectations are not sufficiently managed, there is a high risk that the assumed market response will not occur. The three main lessons that emerge from this case are: expectations management is needed; the reform was as much a political problem as a technical one; and the use of conditions to push through reforms was ineffective given the lack of reform ownership by the Government.

3. Partial Equilibrium Analysis: Comparative Institutional Analysis (Case 4 in Appendix 3)

A strand of the emerging institutional economics, the transaction-cost framework of analysis, is at a nascent stage but has been gaining interest as it offers an additional perspective to microeconomic analysis. Transaction costs are variously defined as the costs of making exchange or as indirect production expenses, as opposed to the costs of production or transforming inputs into outputs or direct production expenses.¹⁸

While the standard neoclassical economic analysis rests primarily on the price mechanism in allocating resources, transaction-cost analysis proceeds from the premise that the price mechanism is not always efficient and that a different mechanism functions within the firm. This logic dates back to Coase's (1937) explanation that when a firm internalizes its costs, the internalization overrides the price mechanism due to the transaction costs incurred. This implies that the boundaries, or "frontiers" of a firm depend not only on the productive technology, but also on the "costs of doing" business (Klein 1999).

According to the transaction cost school of thought, institutions that evolve to lower these costs are key to the performance of economies. When transaction costs are absent, the initial

assignment of property rights does not matter from the point of view of efficiency because rights can be voluntarily adjusted and exchanged to promote increased production. But when transaction costs are substantial, as is usually the case, the allocation of property rights is essential.

A limitation still exists on the extent to which comparative institutional analysis can be appropriately quantified in view of the difficulty in measuring transaction costs and in assigning empirical proxies for key variables, especially uncertainty (Klein 1999). So, empirically, institutional analysis depends mostly on qualitative case studies. An illustration of comparative analysis for each type of governance structure or institutional arrangement is given in the Agency Cost Approach in Case 4, Appendix 3.

4. Applied General Equilibrium Modeling (Case 5 in Appendix 3)¹⁹

The most comprehensive and sophisticated way to assess poverty impacts of policy change, including the capture of feedback and intertemporal economic effects, involves using either a social accounting matrix (SAM) or, in a more dynamic form, a computable general equilibrium (CGE) model based on a SAM. A CGE model is used to provide an evaluation of the effects of broad policy changes including exogenous shocks, economic policy

¹⁸ For further discussion, see for example, <http://www.encycogov.com>, 2001, "Decomposing Cost into Transaction Costs and Production Cost"; and Kherallah et al. undated.

¹⁹ Case 5 in Appendix 3 is preceded by an expanded discussion of the principles of computable general equilibrium analysis.

changes, and changes in the domestic economic and social structure. A SAM model is a square matrix with columns for expenditure and rows covering income accounts. It combines input-output data with the national accounts to reflect the circular flow of income at a particular point in time. In this context, its key use is as a means of assessing the direct and indirect income effects of a particular exogenous impact—such as a policy change leading to different expenditure patterns.²⁰ Since SAMs can be constructed with different groupings of households, they can be used to assess how the poorer households are affected. SAMs are typically static systems with fixed coefficients and prices. However, they can be extended to more dynamic models by the incorporation of behavioral equations relating to the major markets in an economy. These, combined with key parameters relating, for example, to various demand and supply elasticities, can be developed into a full macro model. Such models normally assume optimizing behavior, with flexible prices clearing all markets. The advantage of these models is that they can be designed to incorporate features of individual economies and can be run for different policy simulations. Such models are conceptually the only rigorous means of assessing the counterfactual—what would have taken place in an economy without a particular policy reform. Versions of such models have been used in a number of countries to assess the poverty impact of policy

change. In Asia, these countries include Indonesia (Thorbecke 1991), and Malaysia (Demery and Demery 1991).

A combined use of CGE and SAM is considered a state-of-the-art methodology for *ex-ante* assessment of policy change.²¹ However, the practical relevance of such methodology remains a subject of considerable debate. Even relatively sophisticated models based on the data from a large and recent SAM must, of necessity, be a major simplification of reality. Key parameters will often be assumed or simply taken from work on other economies. Also the structure, such as the “macro-closure rule” and functional forms of production aggregation, used for the models can itself influence their results.

For example, de Maio et al. (1999) and the reply by Sahn et al. (1999) debate the usefulness and accuracy of CGE models in assessing the relationship between poverty and adjustment in Africa. In addition, such models can normally cope with the impact of discrete policy changes such as a devaluation, a fall in aggregate government expenditure, a change in interest rates, or the removal of a

²⁰ For recent application to policy analysis, see Iqbar and Siddiqui (1999) and Khan (1999).

²¹ Dervis et al. (1982) and Robinson (1989) provide surveys for CGE models that follow the assumption of imperfect substitutability between imports and exports—the Armington assumption. A detailed introduction to the structure of SAMs and CGE models is given by Sadoulet and de Janvry (1995), chapters 10 to 12. Scarf and Shoven (1984) and Shoven and Whalley (1992) provide a survey of models of a more pure trade nature (perfect substitutability between imports and exports of a homogeneous character). They also provide the workings of benchmark equilibrium calibration and solution algorithms.

particular subsidy. However, the effects of more general reform measures, such as strengthening of the financial sector, institutional change in the civil service, or a new road-building program, may be difficult to express in exact quantitative terms and hence, difficult to incorporate in the models.

Finally, and perhaps crucially in the context of ADB operations, accurate modeling of this type is demanding in data, skills, and research resources. An effort by the World Bank—the [Integrated Macroeconomic Model for Poverty Analysis \(IMMPA\) Project](#)—is an attempt to combine CGE and SAM further with a financial programming model and household survey data in order to measure distribution impacts of various macroeconomic policies (World Bank 2001a).

A short-cut approach to country-specific CGE modeling is to establish “generic” models for particular types of economy—for example, one could be for a low-income labor-surplus economy as found in South Asia or the poorer parts of East Asia and another for transitional economies. Such models could be based on “typical” data of an assumed nature

and used to assess the possible consequences of different interventions for poverty. Their results can be no more than suggestive since the models themselves are not based on an individual economy, but they can give policy makers an insight into possible poverty outcomes under different scenarios and assumptions. Thorbecke (2001) describes the construction of such an archetypal model for an African economy, as well as the extension of his earlier work in Indonesia, to model the post-Asian financial crisis trend in poverty and distribution. Further, he highlights one of the main uncertainties in this type of work: how distribution within particular income groups changes in response to external economic shocks. Potentially useful as such models are, they are best seen as part of research initiatives that can provide the background to discussions of operational issues of policy operations.

Table 7 summarizes the different approaches to poverty impact assessment of policy changes and their limitations, and gives examples of ADB-supported programs that either have been or could have been assessed using these approaches.

TABLE 7: Approaches to Assessment of Policy Operations

Approach	Advantages	Disadvantages	Possible Application
Descriptive statistical analysis and ad hoc calculations	<ul style="list-style-type: none"> • Simple to apply • Minor data and time requirements 	<ul style="list-style-type: none"> • Requires specific parameters such as demand and supply elasticities • Captures only one dimension 	<ul style="list-style-type: none"> • Power restructuring e.g., Loan 1662-PHI. • Health reform e.g., Loan 1568-MON • Education e.g., Uzbekistan Education Sector Development Program
Partial equilibrium modeling: Market and price analysis	<ul style="list-style-type: none"> • Fewer data required than computable general equilibrium modeling • More workable and easier to interpret results qualitatively 	<ul style="list-style-type: none"> • Cannot capture computable general equilibrium modeling feedback effects • Not useful for complex reforms 	<ul style="list-style-type: none"> • Self-contained price changes such as agriculture subsidy e.g., Loan 1739-PHI
Partial equilibrium modeling: Comparative institutional analysis	<ul style="list-style-type: none"> • Considers the costs of institutional transactions that can be key to understanding incentives and efficiency improvements 	<ul style="list-style-type: none"> • Limited in ex-ante analysis because of the difficulty in estimating transaction costs 	<ul style="list-style-type: none"> • Transaction cost approach is relevant in analyzing the rural economy where small farmers and traders facing high transaction costs resulting in thin markets, market failure in the provision of credit, inputs, and services, and incomplete or imperfect land and labor markets e.g., Loan 1739-PHI
Applied computable general equilibrium modeling	<ul style="list-style-type: none"> • Can simulate counterfactuals • Useful for impact of price changes like devaluation and interest rate rises 	<ul style="list-style-type: none"> • Considerable data and time requirements • Results are sensitive to assumptions and model specifications 	<ul style="list-style-type: none"> • Trade reform e.g., Loan 1680-PAK • Financial sector reform e.g., Loan 1485-VIE

Source: EREA staff, Asian Development Bank.