

Chapter 4

ECONOMIC ANALYSIS IN PROJECT, SECTOR, AND PROGRAM LOAN RRPs



A. RRPs APPROVED IN 2005

In 2005, ADB approved 61 public sector projects and programs, amounting to \$6.8 billion.¹ Of these, 14 (50.9% of the total value of loan approvals) were in transport and communications; eight (9.1%) in water and sanitation; eight (4.6%) in agriculture, environment, and natural resources;

six (11.6%) in governance-related interventions, five (1.7%) in education and health; and four (9.3%) in energy. The balance were in finance, industry, and trade, or were multisector projects or programs (Table 7). In terms of lending modality, there were 35 (42% of the total value of loan approvals) project loans; seven (33.9%) sector loans; nine (12.4%) policy-based program loans; and 10 (10.8%) other

Table 7. Basic Information on RRPs Reviewed

	Loan Amount Approved in 2005		Proposals	
	\$ million	Percent share	Number	Percent share
By Sector	6,808.48	100	61	100
Agriculture and natural resources	314.40	4.6	8	13.1
Education	58.06	0.9	3	4.9
Energy	636.50	9.3	4	6.6
Finance	185.50	2.7	4	6.6
Health, nutrition, and social protection	57.90	0.9	2	3.3
Industry and trade	25.00	0.4	1	1.6
Law, economic management, and public policy	793.00	11.6	6	9.8
Transport and communications	3,462.80	50.9	14	23.0
Water supply, sanitation, and waste management	618.00	9.1	8	13.1
Multisector	657.32	9.7	11	18.0
By Lending Modality	6,808.48	100	61	100
Project loan	2,819.68	42.0	35	59.0
Program loan	843.50 ^a	12.4	9	14.8
Sector loan	2,407.50	33.9	7	9.8
Credit line	25.00	0.4	1	1.6
Technical assistance loan	36.00	0.5	3	4.9
Special assistance loan	321.80	4.7	3	4.9
Sector development program – program loan	300.00 ^a	4.4	1	1.6
Sector development program – project loan	30.00	0.4	1	1.6
Sector development program – sector loan	25.00	0.4	1	1.6

^a Includes only amounts for the first tranche.

Source: ADB Project Processing Information System database.

¹ Fifty-eight RRPs were approved, three of which were concerned with two operations.

loan types (credit line, TA loans, special assistance loans, among others). Retro 2005 did not cover RRP for credit lines, TA loans, and special assistance loans. The rest of this chapter is organized into two parts. Part B covers 39 project and sector loan RRP and Part C reviews 10 program loan RRP.

B. PROJECT AND SECTOR LOANS

1. Summary of ratings

Each of the six attributes of economic analysis for the 39 project and sector loan RRP (35 project loans and 4 sector loans)—economic rationale, demand analysis, alternatives analysis, cost–benefit analysis, sustainability analysis, and sensitivity and risk analyses—was rated on the 1–4 point scale. Table 8 summarizes the results.

About half of the attributes of project economic analysis were rated “partially satisfactory” or “unsatisfactory”, with the other half “generally satisfactory” or “fully satisfactory” on average for the 39 project and sector loan RRP as a whole. Among the six attributes of project economic analysis, cost–benefit analysis² scored highest (a 3.2 average), followed by sensitivity and risk analyses and sustainability analysis (both 2.7), demand analysis (2.4), analysis of economic rationale (2.3), and alternatives analysis (2.0). More than half of the RRP were rated either “generally satisfactory” or “fully satisfactory” in the cost–benefit analysis

and sensitivity and risk analyses, while more than half were rated either “unsatisfactory” or “partially satisfactory” in the other four attributes. The weakest area of economic analysis was alternatives analysis, with 30 projects (77%) rated as either “unsatisfactory” or “partially satisfactory.”

For most attributes, more projects in transport, energy, water supply, and sanitation were rated as “generally satisfactory” or “fully satisfactory” than in agriculture, natural resources, education, and health. Regional departments need to make greater efforts to improve analysis of economic rationale and of alternatives in social sector and agriculture projects. As shown in Table 9, across economic sectors, hardware projects in transport, energy, water supply, and sanitation showed consistently higher ratings relative to agriculture and social sector projects. The biggest difference is seen in demand, alternatives, and cost–benefit analyses. Agriculture and social sector projects did particularly poorly in demand analysis and alternatives analysis, with barely 9% and 14% of projects rated “generally satisfactory” and “fully satisfactory”, respectively. There may be a temptation to explain the poorer economic analysis of social sector and agriculture projects on the grounds that techniques for economic analysis are better established for hardware infrastructure projects than for other projects. This may be true in areas such as cost–benefit analysis and demand analysis.³ However, there seems to be little reason for the social and agriculture sector projects to have weak

Table 8. Ratings and Average Scores by Attribute of Economic Analysis—Project and Sector Loans

Attribute	Number of RRP Rated as				Mean Score
	US (1)	PS (2)	GS (3)	FS (4)	
Analysis of Economic Rationale	2	27	10	0	2.3
Demand Analysis	8	15	15	1	2.4
Alternatives Analysis	13	17	8	1	2.0
Cost–benefit Analysis	2	4	25	8	3.2
Sustainability Analysis	5	16	14	4	2.7
Sensitivity and Risk Analysis	1	18	18	2	2.7

US means unsatisfactory scored at 1; PS means partially satisfactory scored at 2; GS means generally satisfactory scored at 3; and FS means fully satisfactory scored at 4.

Note: Mean score is the simple arithmetic average of individual scores.

Source: ERD staff estimates.

² Cost–benefit analysis as defined here only involves identifying and, wherever possible, quantifying and valuing economic benefits and costs, and calculating the expected internal rate of return (EIRR). This definition applies throughout the discussions in this chapter.

³ For instance, computer programs are widely available for forecasting demand, assessing project benefits, and conducting sensitivity tests and risk analysis for transport and energy projects. This is not the case for many social and agriculture projects.

Table 9. Percentage of Project and Sector Loan RRP's Rated as "Generally Satisfactory" or "Fully Satisfactory" by Attribute and Sector

	Analysis of Economic Rationale	Demand Analysis	Alternatives Analysis	Cost-benefit Analysis	Sustainability Analysis	Sensitivity Analysis
Agriculture and Natural Resources	63.6	9.0	9.0	72.7	45.4	45.4
Energy, Water Supply, and Sanitation	62.5	50.0	50.0	100.0	50.0	50.0
Transport	61.5	76.9	23.0	92.3	53.9	53.9
Education and Health	28.6	14.3	14.3	71.4	28.6	57.1

Note: Transport also includes rural and urban roads.
Source: ERD staff estimates.

analysis of economic rationale and of alternatives. Similar findings were highlighted in the retrospective reviews of 2002 and 2003.

2. Analysis of economic rationale

In many RRP's reviewed, problem diagnosis was generally adequate, but the justification for public sector intervention was often not compelling. At the project or sector level, establishment of economic rationale involves diagnosing problems to be addressed, rationalizing public sector intervention, justifying ADB's involvement, and assistance modality. A link between the proposed project and the CSP should be established. Problem diagnosis in most RRP's reviewed was generally adequate, but the justification for public sector intervention was often weak. Many failed to discuss issues related to market failures as a result of the public good nature of goods and services, economies of scale, natural monopoly, or externalities; or government failures, such as poor economic management or weak institutions. For example, in the RRP for PRC: *Jilin Water Supply and Sewerage Development Project*, the discussions centered on water pollution and scarcity and the project's potential contribution to controlling these problems. A detailed discussion of the public "bad" nature of these environmental problems and the relative efficiency of the public sector would have provided a better justification for public sector intervention.

Some RRP's were poor in justifying ADB involvement in the project and choice of financing

modality. Justification for ADB involvement in the RRP's reviewed was typically limited to general statements such as "the project had social benefits" and "the government lacked the means to implement it" and, therefore, "ADB's assistance was needed." The justification for choice of lending modality was ignored in many RRP's. As such, opportunities to showcase ADB core competencies and value-added were lost.

Although the articulation of economic rationale leaves a lot to be desired overall, one RRP, *VIE: Preventive Health System Support Project*, stands out as a good example of economic rationale analysis. The RRP presented a clear and coherent problem diagnosis. The proposed solution to the identified sector problems was based on an analysis of preventive and curative health care, and an assessment of the country's health system and public institutions. The RRP justified public sector intervention by clearly explaining the lack of incentives to invest adequately in preventive health care because of its public goods nature and positive externalities. ADB involvement was justified by a clear link between the proposed intervention, the CSP, and ADB's country sector strategy and past experience.

3. Demand analysis

Demand analysis was one of the weakest areas of project economic analysis, and this is especially true for agriculture and social sector projects. Demand analysis assesses consumer demand for goods or services and provides a basis for estimating

economic benefits. A project that does not meet consumer demand will not meet its objectives or generate benefits, resulting in resource wastage and misallocation in the economy. Analysis of tariffs and pricing policy is also an important component of a demand analysis.

Of the 39 RRP's reviewed, eight were rated "unsatisfactory" (as there was no demand analysis), 15 "partially satisfactory", and another 16 "generally satisfactory" or "fully satisfactory." Typically, RRP's classified as "partially satisfactory" conducted some analysis of demand, but the presentation lacked substance. For example, the RRP for *IND: Chhattisgarh Irrigation Development Project* presented at length the results of user surveys, but only briefly discussed farmers' willingness to pay for water. The RRP for *PRC: Central Sichuan Roads Development Project* was rated "fully satisfactory" and clearly explained how traffic forecasts were prepared. It also analyzed changes in projected demand based on different prices and economic growth scenarios.

4. Alternatives analysis

Alternatives analysis was not presented in many RRP's, and thus continued to be the weakest area of economic analysis. This is an area of economic analysis that is in critical need of attention by regional departments. Weak alternatives analysis was also a major theme in the 2002 and 2003 retrospective reviews. Alternatives analysis assesses the best way to meet the objectives of a project from a set of alternative, mutually exclusive options such that the project is least-cost or cost-effective. As in the retrospective reviews of 2002 and 2003, alternatives analysis continued to be the weakest area of economic analysis with an average score of 2.0. Of the 39 RRP's, 13 were rated "unsatisfactory" because alternatives analysis was not mentioned, and 17 were rated "partially satisfactory." Given the importance of selecting the right option for project quality and development impact and ensuring the cost effectiveness of proposed project designs, this is an area of economic analysis that is in critical need of attention by regional departments. Weak alternatives analysis was also a major theme in the 2002 and 2003 retrospective reviews. The RRP for *BAN: Gas Transmission and Development Project* was the only project with a "fully satisfactory" rating. A thorough comparison of costs for different project designs made clear that the planned investment

derived from an analysis of transmission networks using alternative technical specifications. The analysis was supported by computer simulations of locations, lengths, pressure regimes, and scales of compressors and pipelines to identify the least-cost solution.

5. Cost-benefit analysis

Cost-benefit analysis was the most satisfactory of project economic analyses, with about 85% of projects rated as "generally satisfactory" or "fully satisfactory." A project selected for ADB financing must ensure that its economic benefits sufficiently outweigh its economic costs. This is usually done by comparing project economic costs with benefits and, when possible, calculating an economic internal rate of return (EIRR). A key step in comparing benefits with costs is to establish a counterfactual or "without project" scenario that helps identify the incremental nature of the intervention. Detailed cost and benefit identification and valuation are required when project costs and benefits can be clearly identified, quantified, and valued. When this is not possible, economic viability may be demonstrated on the basis of a project's economic rationale and cost effectiveness. Important economic benefits that cannot be quantified should also be considered in the analysis. In sector loans, where project activities have yet to be identified, it is important to establish selection criteria for subprojects based on economic considerations such as cost effectiveness and cost-benefit comparisons.

Overall, cost-benefit analysis scored the highest with an average of 3.2 points. Of the 39 projects, only four were rated "partially satisfactory" and two "unsatisfactory"; the remaining 33 projects (85%) were rated as "generally satisfactory" or "fully satisfactory." The RRP for *BAN: Gas Transmission and Development Project* is a good example of a cost-benefit analysis. The project was designed to extend gas transmission pipelines into less developed regions of the country. The project conducted the analysis of costs and benefits on the basis of detailed demand forecasts for new and existing end users. Economic benefits were identified based on a counterfactual scenario, quantified, and valued accordingly.

6. Sustainability analysis

Weaknesses in sustainability analysis were largely due to inadequate discussions on a project's fiscal

implications and the government ability to meet the financial and institutional requirements for operating the project and maintaining output. Project output and development impact will be realized only if the project implementing agency is on a sound financial footing and has the institutional capacity to implement and operate the project over its lifetime. Therefore, a sustainability analysis must assess the financial health of the implementing agency and the effect the project will have on its financial position. In case of revenue-earning projects, the financial sustainability of executing agencies should be carefully reviewed in terms of different revenue sources and their levels (for example, tariffs in a public power utility project). In the case of nonrevenue-earning projects, usually implemented by government departments, the financial analysis should be geared toward assessing the budgetary impact of the project on the implementing agency and the government's longer-term commitment to it. Similarly, an assessment of institutional sustainability determines whether the implementing agency has the capacity to implement and operate the project over its lifetime.

More than half of projects (21) were classified as either "partially satisfactory" or "unsatisfactory" in sustainability analysis. Some of the RRP's with a "partially satisfactory" rating only provided very brief discussions to demonstrate the central or local government's financial capacity to provide required counterpart funds. Some discussed only institutional matters to show that the government had the capacity to operate the project. An example that discussed both is *MLD: Regional Development Project II – Environmental Infrastructure and Management*. This RRP carefully conducted an affordability analysis of the tariffs and studied consumers' willingness to pay. It also discussed the project implementation capacity of community-based organizations and nongovernment organizations. Similarly, the RRP for the *PRC: Fuzhou Environmental Improvement Project* discussed in detail institutional reforms and financial autonomy of the implementing agency to charge wastewater tariffs that covered operation and maintenance costs and loan repayments.

7. Sensitivity and risk analyses

Sensitivity analysis was rated "partially satisfactory" or "unsatisfactory" in about half of the RRP's, where only simple scenarios of project costs and benefits

increasing or decreasing by certain percentages were studied. Sensitivity and risk analyses assess the robustness of the economic viability of a proposed project, given the uncertainties in the future value of certain defined variables. In particular, sensitivity analysis identifies parameters sensitive to the project decision and the extent to which changes in these parameters would result in rejecting the project; and risk analysis assesses the probability that the project EIRR falls below the opportunity cost of capital given simultaneous changes of key sensitive variables. Moreover, sensitivity and risk analyses need to be supported by discussions on mitigating measures that should be incorporated in project design.

Sensitivity analysis was "partially satisfactory" or "unsatisfactory" in about half of the RRP's. Typically, sensitivity analysis in these RRP's only looked at scenarios of project costs and benefits increasing or decreasing by certain percentages. One case where the sensitivity analysis was good is *SRI: Technical Education Development Project*. In this RRP, project benefits were found to be most sensitive to changes in the employment rate of graduates, promotion and completion rate of students, and number of students enrolled. An analysis was then undertaken to determine the extent to which the EIRR would be affected by changes in these key variables. The simulated distribution of EIRRs was presented.

Very few RRP's performed risk analysis. Regional departments should make greater efforts to ensure that an assessment of risk is part of economic analysis. Only four of the 39 RRP's performed a risk analysis, three of which were energy projects and one transport. The risk analysis in these four RRP's indicated the probability that the EIRR would fall below the critical value of 12%. There was no attempt to perform risk analysis in the other 35 RRP's. For social sector projects, risk analysis may not be easy because some variables, such as those of economic benefits, are not easily quantifiable. However, for those infrastructure projects that did not conduct a risk analysis, costs and benefits were generally well defined and a risk analysis was possible.

C. PROGRAM LOANS

1. Summary of ratings

The assessment of the quality of economic analysis for ADB's policy-based lending operations covered

Table 10. Rating Distribution by Attribute of Economic Analysis—Program Loans

Attribute	Number of RRP's Rated as				Mean Score
	US (1)	PS (2)	GS (3)	FS (4)	
Analysis of Economic Rationale	0	0	6	4	3.5
Government Reform Plan and Capacity	0	2	8	0	2.8
Program Design	0	1	4	5	3.4
Determination of Loan Size	3	2	5	0	2.2
Benefit and Impact of Reform	0	3	7	0	2.7
Risk Assessment	0	1	9	0	2.9

US means unsatisfactory scored at 1; PS means partially satisfactory scored at 2; GS means generally satisfactory scored at 3; and FS means fully satisfactory scored at 4.

Note: Mean score is the simple arithmetic average of individual scores.

Source: ERD staff estimates.

10 program loans (including one sector development program loan) approved in 2005 (Table 10). Most program loans were related to governance and financial sector reforms. Among the six attributes of economic analysis, analysis of economic rationale scored the highest (3.5 points), followed closely by program design (3.4), risk assessment (2.9), government reform plan and capacity (2.8), benefit and impact of reform (2.7), and determination of loan size (2.2). A review of each individual attribute is discussed below.

2. Analysis of economic rationale

Many program loan RRP's contained reasonably adequate problem diagnosis. Program loans often involve significant policy reform components. Analysis of economic rationale should focus on problem diagnosis and justification for ADB involvement. Problem diagnosis should assess key institutional, incentive, infrastructural, and informational problems that constrain sector performance. With a few exceptions, most of the reviewed program loan RRP's contained reasonably clear analysis and discussions on major issues, problems, and constraints. In the case of three loans where the program was a series of subprograms or clusters, issues anticipated after the initial intervention were also identified and discussed. Nevertheless, improvement in the treatment of the macroeconomic context could be considered in some RRP's.

Analysis of the justification for ADB involvement could be improved. ADB's support for policy reform is based on the relevance of the reforms to the government's macroeconomic and sector objectives and to ADB's strategic priorities in the DMC. Thus,

an RRP should explain why ADB supports the government in its reform efforts. This should be considered in the context of the CSP and experience from previous interventions in the DMC. If other donors are involved, donor coordination should also be assessed. Most RRP's were able to justify ADB involvement, but the justification could have been better explained. In the three RRP's where weaknesses were observed, justifications were not well articulated and the link between ADB interventions and the concerned CSP's was not clearly established. There were also cases where the ADB role in a multi-donor setting was not adequately discussed. The RRP for *AFG: Fiscal Management and Public Administration Reform Program* is a case in point. There were many donors involved in the areas where the ADB program loan was targeted. As duplication was a significant risk, the rationale for the ADB program should have been more clearly explained.

3. Government reform programs and implementation capacities

There were also weaknesses in the assessments of government reform programs and implementation capacities. The rationale for program lending is to support policy and institutional reform in a DMC or a sector over the medium to longer term. Therefore, the policy reform measures to be implemented under a program loan must be consistent with the government's own reform plan, the government's commitment to reform and its capacity to implement the reform measures must be ensured. Most RRP's discussed government reform plans and strategies, but there were several cases where discussions were inadequate. In some instances, the government's vision and long-term strategy for the sector were

simply listed and an implicit assumption seemed to have been made that the government held ownership and was committed to the reform plan. In others, implementing agencies were simply identified, but their capacity to implement the reform plan was not assessed. For example, in the RRP for *AFG: Fiscal Management and Public Administration Reform Program*, the executing agency and the oversight and coordinating agency were described and working arrangements between them explained. But there was no assessment of the capacity of these agencies to implement and coordinate the program activities.

4. Program design

Discussions on program design were generally comprehensive in many RRP, with activities and program components linked to the identified problems. A well-designed program loan is responsive to the objectives of policy and institutional reforms. To ensure that objectives are achieved, the design of the program must (i) link the problem diagnosis with program scope; (ii) link the policy framework with the actions to be undertaken; and (iii) link implementation arrangements with outcomes. Discussions of program design in many RRP were generally comprehensive and activities and program components were linked with the identified problems. The RRP for *PAK: Punjab Resource Management Program (Subprogram 2)* is a good example of a well-articulated program with the linkage between activities and outcomes to policy objectives clearly presented.

5. Determination of loan size

Program loan RRP should provide a sound basis for determining loan size. In the past, loan size was often determined on the basis of estimated adjustment costs arising from policy reforms supported by particular operations. The advantage of estimating adjustment costs is that it requires the government and project mission to thoroughly understand possible economic and social consequences of the policy reforms concerned, and to take such consequences into consideration in designing the program. In practice, however, it is often difficult to obtain credible adjustment cost estimates as a basis for the program loan size due to the complexities of policy reforms and uncertainties involved. Therefore, in recent years there has been a move away from adjustment cost estimation in determining the

size of policy-based lending among aid agencies.⁴ The general approach now is to identify financing needs (including adjustment costs if applicable) of a particular development or reform package supported by a program loan concerned, with portions met by the government and donor agencies, and the amount covered by the loan concerned.⁵ This can be done by analyzing the government's medium-term budgetary or expenditure framework or through other budget analyses. In ERD's view, whichever approach is followed, program loan RRP should provide and justify the basis of the loan size.

Determination and justification of loan size was the weakest part of the economic analysis of program loans among the RRP reviewed. Among the 10 program loan RRP reviewed, five provided estimates of adjustment costs, but there was often a lack of adequate discussion on the basis of the estimates or the distribution of adjustment costs. For instance, in the RRP for *PAK: Punjab Resource Management Program (Subprogram 2)*, a generic statement on the main components of adjustment costs was provided with no explanation. The reference to a supplementary appendix was inappropriate for a matter that comprises the main rationale for the size of the program loan. The other five program loan RRP did not provide adjustment cost estimates, nor was an alternative basis for the loan size provided. There were either no or only limited discussions on justifications for loan size in terms of budgetary analysis.

6. Benefit and impact of reforms

Analysis of benefits and poverty impacts could be improved by identifying channels through which the benefits and impacts were to be achieved. The benefit and poverty impacts of policy and institutional reforms depend on the nature of the reforms and may not be immediate. Interventions may also be long-gestating, or could be only one part of a sequence of measures to remove constraints to improved economic and sector performance. In these instances, economic analysis should highlight channels and mechanisms through which the proposed reform measures will work. Presumptions regarding the long-run benefits of reforms should not substitute for a detailed analysis of their impact.

⁴ Such as the World Bank.

⁵ ADB is currently reviewing the business process for program loan lending, including the determination of loan size.

In many of the program loan RRPs reviewed, benefits and poverty impacts were enumerated and, in some cases, explained at length. However, the channels through which these benefits and impacts were to be achieved were often not mentioned, although channels were sometimes implicit in the discussion of expected benefits. The time dimension of impacts and degree to which the benefits are direct or indirect were also often not explained. A good example of a discussion of benefits and impacts is found in *PAK: Punjab Resource Management Program (Subprogram 2)*. The RRP clearly presented how the effects will work through public sector expenditures and enhanced incentives for service delivery.

7. Risk assessment

The main weakness in risk assessment was in the discussion of risk mitigation. Most program loan RRPs adequately assessed risks to achieving program objectives. They also discussed major factors of the political economy. For example, the RRP for *MON: Financial Regulation and Governance Program* recognized possible resistance from vested interests and the risk of delay in passing legislation (tax reform, new laws against money laundering, and amendments to securities market and cooperatives laws). The recognition of the delay risk was important because delays in legislation were a recurrent problem in Mongolia and would likely have a serious adverse impact on program implementation. The main weakness in many risk assessments was in the discussion of risk mitigation. The RRP for *PHI: Microfinance Development Program*, for example, listed risks, but did not discuss risk-mitigating measures.