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Evaluation of Stakeholder Impacts in Cost-Benefit Analysis

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ABSTRACT

This paper expands the scope of the analyses of both public and private investment projects beyond the traditional criteria of the financial and economic net present value of an investment. It shows that if the economic and financial analyses are carried out using a common numeraire, preferably, expressing all values in terms of the domestic prices at the domestic price level, the scope of the analysis can be expanded to include issues of stakeholder impacts, poverty impacts, and an assessment of the long term sustainability of the project. Instead of just providing summary statistics of the financial and economic net present values for the project, we are now able to assess the income impacts that the project will have on different interest groups in society. An important contribution of this analysis is that it forces the analyst to do a reconciliation between the economic performance, the financial performance and the distributional impacts of a project. If the economic and financial analysis of a project have been done consistently, the distributional stakeholder analysis is a relatively straight forward outcome. The benefits of such an extension of the analysis is very important for assessing the political-economic dimensions of public sector investments. The paper contains three examples of projects undertaken in Cyprus, Bangladesh and the Philippines. In each of these cases a traditional economic and financial analyses would not have identified many of the most important aspects of the process that determined whether or not the projects would be implemented and sustainable.

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EVALUATION OF STAKEHOLDER IMPACTS IN COST-BENEFIT ANALYSIS

By

Glenn P. Jenkins

1. TRADITIONAL PROJECT ANALYSIS

Traditional approaches to the appraisal of investment projects have tended to undertake the economic analysis in isolation from the financial analysis, hence ignoring the interaction of the financial and economic outcomes. More often than not, the impact of possible changes in the economic policy environment has not been factored into the design of the project and the assessment of its risk. Consequently, analysts have often failed to identify and make provisions for policy and institutional variables that are important determinants of the sustainability of many of these investments. The economic distortions that financially subsidize a project, when removed, have often become a source of failure for these investments. Reductions in the rate of trade protection is a well known example of this situation. Another reason for conducting an integrated financial economic investment appraisal is that there is a need to identify the project's stakeholders, the groups who will benefit from the project and those who will lose. A project's likelihood of successful implementation or long term sustainability is likely to be threatened if specific groups in society are unwillingly hurt by it. In many cases, the most important factor determining a project's sustainability is its impact on the government budget. For sustainability, the project's fiscal impact must be consistent with the ability of the public sector to finance such activities.

2. AN INTEGRATED FINANCIAL/ECONOMIC/DISTRIBUTIVE ANALYSIS

The social analysis of a project may be organized into two parts: estimating how the income changes caused by the project are distributed (including the reconciliation of financial, economic, and distributional appraisals) and identifying the impact of the project on the principal objectives (basic needs) of the society.

The distributive analysis of the project asks the following questions: Who will benefit from the project and by how much? Who will pay for the project and how much will they pay? Project sustainability is heavily impacted by which party in the project's sphere of influence gains or loses. If an influential group is expected to bear the burden of losses, then the successful implementation of the project may be hindered. The risk of a strong political opposition to the project mobilized by the losing party is a contingency that the project implementers should be prepared to tackle.

Another aspect of the social analysis is concerned with cases in which projects will facilitate or hinder the process of helping society address its basic needs. For example, a road

project may not only reduce transportation costs, but also may increase the level of security in a village or may allow more children to attend school, both of which are viewed positively by the society. In such cases society may want to credit a social externality net benefit to the project.

A. Distributive Analysis

A traditional financial analysis examines the financial feasibility of the project from the owners' and total investment point of view. Economic analysis evaluates the feasibility from the point of view of the whole country or economy. A positive economic net present value (NPV) implies a positive change in the wealth of the country, while a positive net present value from the point of view of those with a financial interest in it, indicates a positive expected change in the wealth of these particular stakeholders.

The difference between the financial and economic values of an input or output represents a benefit or a cost that accrues to some party other than the financial sponsors of the project. These differences can be analyzed by undertaking a distributive analysis that allocates these externalities (differences between economic and financial) to the various parties affected. For example, a project that causes the price of a good to fall will create economic benefits that are greater than its financial revenues. This difference between the financial and the economic values will represent a gain to the consumers of the output and a somewhat smaller loss to the other producers of the good or service who are competing in the market with the project. The differences between the financial and economic values of inputs and outputs also may arise due to a variety of market distortions such as taxes and subsidies, or because the item is sold to consumers at a price different from the marginal economic cost of additional supply.

Tariffs, export taxes and subsidies, excise and sales taxes, production subsidies and quantitative restrictions create common market externalities. Public goods are normally provided at prices different than their marginal economic costs. The economic values of common public services such as clean water and electricity are the maximum amounts people are willing to pay for these services. These values are often significantly greater than the financial prices people are required to pay for the services. Any of these factors will create divergences between the financial and the economic prices of goods and services consumed or produced by a project.

A distributive analysis is composed of six distinct steps:

- Identify the externalities;
- Measure the net impact of the externalities in each market as the real economic values of resource flows less the real financial values of resource flows;
- Measure the values of the various externalities throughout the life of the project and calculate their present values (using the economic discount rate);
- Allocate the externalities across the various stakeholders of the project;

- Summarize the distribution of the project's externalities and net benefits according to the key stakeholders in society;

- Reconcile the economic and financial resource flow statements with the distributional impacts.

In essence, a distributive analysis seeks to allocate the net benefits/losses generated by a project. As a result this analysis is important to decision makers, as it lets them estimate the impact of particular policies or projects on segments of society, and to predict which groups will be net beneficiaries and which groups will be net losers.

B. Poverty Alleviation

The magnitude of a project's direct impact on poverty alleviation is a variable that the feasibility study of a project is frequently expected to estimate.[1] When a project reduces the price of a good or service, the consumers of the output can acquire the good at a lower price. This net benefit will be identified and quantified in the distributive analysis. If the poor are the consumers, this project will have a poverty alleviation impact. In the case of water, the willingness to pay by the poor to water vendors is often fairly high due to the necessity of water. Often the poorer areas with limited access to water are paying more for marginal supplies of water than are the better off consumers. Thus, a new project that increases the supply of potable water and provides it at a lower price for everyone, but more importantly to the poorer strata of the society, will contribute to poverty alleviation. To be able to quantify this impact one needs to evaluate the differences between the economic value and financial cost of the water being consumed by the various income groups.

Another channel for a project to have an impact on the incidence of poverty is through the labor market. When the lower income groups sell their services to projects that pay a wage rate significantly above the workers supply prices for their labor, they are likely to be made better off by the project. The differences between the supply price of labor and the financial wage paid will be measured as a distributive externality and can be allocated according to the various income groups, to determine if the project has a direct impact on poverty alleviation.

3. CHOICE OF A NUMERAIRE[2]

A. Need for a Common Numeraire

To undertake an integrated financial, economic and distributive investment appraisal or to evaluate the sustainability of a project, two steps need to be taken:

First, the project's financial profile should be compared on a period by period basis and not just summarized in single statistic such as the NPV or the internal rate of return (IRR). Such summary criteria examined in isolation does not accurately assess the sustainability of a project or its riskiness. Consider a project that has both a large FIRR and a large positive NPV, but also has negative financial cash flows in the early years of its life. Such a project may go bankrupt,

jeopardizing its economic performance, long before it has a chance to generate the large positive net cash flows expected in later years. It is the examination of the cash flows year by year over the project's lifetime that will give the analyst an indication of the sustainability and financial riskiness of the project. If a project is clearly not financially feasible on its own, then a realistic assessment of the degree of budgetary support it is likely to receive from the government needs to be made. Second, the financial and economic analysis must be expressed in the same unit of account. If we do not use the same numeraire we cannot successfully investigate the differences between financial and economic values of inputs and outputs. If the units of account are different for financial analysis and economic analysis, then the differences between the economic and financial values have no significance or meaning. The three common choices for the numeraire found in the benefit-cost analysis literature are: domestic currency at domestic price level, domestic currency at the border price level, and foreign currency at the border price level.

Financial analysis is usually performed in domestic prices at the domestic price level because these are the currency and the price levels in which the markets of the country operate. Therefore, the use of any other numeraire quickly diminishes the level of understanding that decision-makers will derive from the analysis. Analysts who want to take an integrated approach in examining the risk, sustainability and distributional impacts of a project, will usually find it much easier to work with domestic prices at the domestic price level so that the economic analysis and financial analysis of a project can be readily compared.[3]

B. Equivalence of the Different Numeraire in Ranking of Investments[4]

In the literature on economic cost benefit analyses, the question of the choice of the numeraire when expressing the benefits and costs of a project has received considerable attention. The conclusion of this debate is that choice of using a particular numeraire to express the values of inputs and outputs is basically an issue of convenience that eventually has no effect on relative prices and on the decision to accept or reject the project using the NPV criterion.

The following example illustrates the equivalence of the common alternative numeraires.

Assume there are two goods, Good A and Good B. Good A is an imported good and Good B is only traded domestically (i.e. non traded). Imports of Good A are subject to a 50% tariff. The official exchange rate equals 1.20. Also assume that the economic exchange rate is 1.30. The following tables provide us with prices in the three different choices for the numeraire i.e. domestic currency at domestic price level, domestic currency at the border price level, and foreign currency at the border price level.

Table 1

Exchange Rates:

Official Exchange Rate (OER) = 1.20	Shadow Exchange Rate (SER) = 1.30	Standard Conversion Factor (CF)= OER/SER = 0.92

Table of Different Prices at Different Sites:

	Good A (imported)	Good B (non-tradable)
1. Border Price	$ 100	
2. Domestic Market Price	Rs. 180 (includes 50% tariff)	Rs. 200
3. Economic Cost (domestic price in domestic currency)	Rs. 130 (with SER)	Rs. 200
4. Economic Cost (domestic currency at border)	Rs. 120 (with OER)	Rs. 184 (after applying CF)
5. Economic Cost (Foreign currency at border)	$ 100	$ 153.33 (after applying OER to Rs. 184)

Table 1 summarizes the different price levels which can be used by a country for valuation of tradable and non-tradable goods and services. For the traded Good (A) with a border price of $100, the domestic market price is reached by multiplying the border price with the official exchange rate and then adding the 50% tariff to that resulting price. Thus, we convert the border price ($100) to domestic currency by Rs. 120 and then add on the 50% tariff to give us a domestic market price of Rs. 180, (Row 2). If we wish to derive the economic value of this tradable good in units of domestic currency at the domestic price level, we take the border price of the imported good in foreign currency ($100) and convert it by using the economic exchange rate (1.30) that incorporates the cost of foreign exchange to the economy. Thus, the border price in dollars is multiplied by the economic exchange rate to give us the value Rs.130, (Row 3). Alternatively, if we wish to express its value in domestic currency at the border price level, then we take the border price of the imported good in foreign currency ($100) and convert it to domestic currency by using the official exchange rate. This gives us the value of Rs. 120, (Row 4). To find the costs and benefits in foreign currency at border prices we simply take the value $100 because it is already in foreign currency and at the border level, (Row 5).

For a non-traded Good (B) the domestic market price is as given in the local market in the local currency price of Rs. 200, (Row 2). In the absence of domestic market distortions, this value is equal to its economic value expressed in domestic currency at the domestic price level, (Row 3). To convert this price into domestic currency at the border, we multiply the Rs. 200 with the standard conversion factor. If the conversion factor is 0.92, we will obtain a domestic currency value for this item at a border price level of Rs. 184, (Row 4). To get to a foreign currency value, but at the border price level, we divide the Rs. 184 with the official exchange rate to convert it into foreign currency. Thus, we divide Rs. 184 with the OER (1.20) to find the foreign currency at border price of $ 153.33, (Row 5).

In each of these cases the ratio of the economic value of the non-tradable good to the tradable good is 1.533. If relative prices are unaffected by the choice of numeraires, then if the NPV of a project is negative when expressed in terms of a given numeraire, it will be negative in all cases. These numeraires are simply multiples of each other.

Typically, analysts following the UNIDO method or the approach developed by A. C. Harberger use domestic prices at the domestic price level as the numeraire[5], whereas those who follow the Little-Mirrlees approach use either domestic prices at the border price level or units of foreign exchange as the numeraire.[6]

While the choice of the numeraire will not affect the use of the net percent value as an economic criterion for project selection, it does make a profound difference in being able to undertake a meaningful stakeholder analysis. As commercial transactions in most countries are expressed in units of domestic currency at the domestic price level, the use of this numeraire greatly facilitates communication for the analysis to be carried out from all the different points of view, including that of the economy.

4. RECONCILIATION OF ECONOMIC AND FINANCIAL VALUES OF INPUTS AND OUTPUTS

When the economic values and corresponding financial values of variables are expressed in terms of the same numeraire, then we wish to show for each variable that the economic value can be expressed as the sum of its financial value plus the sum of the externalities which cause the financial and economic value to differ. These externalities may be reflecting such things as taxes, subsidies, changes in consumer and producer surplus or public good externalities.

If each of the variables are discounted using any common discount ratio (in this case the economic discount rate), it must be also be the case that the net present value of the economic net benefits are equal to the net present value of the financial net benefits, plus the present value of the externalities.

This relationship can be expressed as in equation (1) as:

$$(1) \qquad NPV^e_e = NPV^f_e + \sum PV_e\ (EXT_i),$$

where NPV^e_e is the net present value economic benefits and costs, NPV_e^f is the net present value of the financial benefits and costs, and $\sum PV_e\ (EXT_i)$ is the sum of the present value of all the externalities generated by the project; all discounted using a common rate of discount

To indicate how this relationship holds for non-traded and traded goods, the following situations are considered.

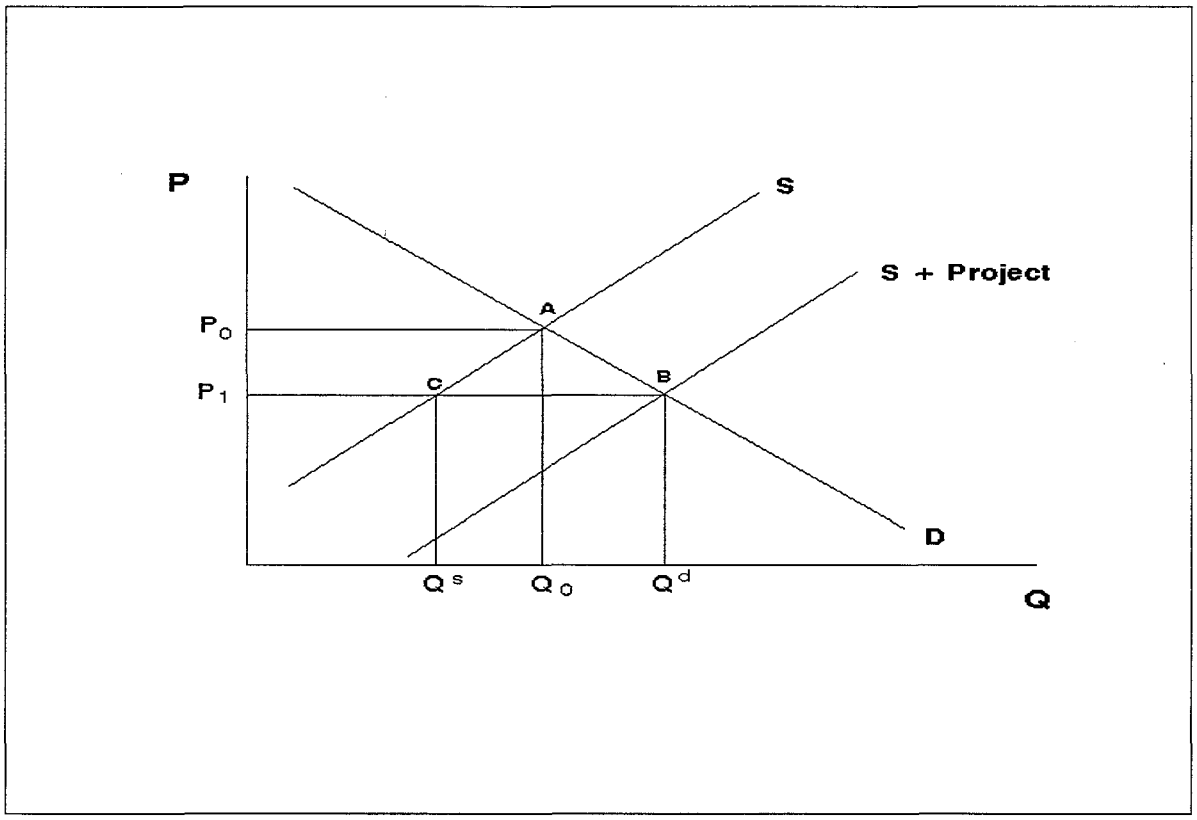
A. The Case of a Major Expansion in the Supply of a Non-Traded Good in an Undistorted Market

In Figure 1 we illustrate the market of a good that is the output of a project. The project results in a non-marginal increase in the supply a non-traded good in a market with no tax or subsidy distortions. One such example would be a project that increases the supply of drinking water, at a lower cost, hence expanding total consumption while also reducing the quantity generated by higher cost plants.

Before the project was introduced, the equilibrium price and quantity were P_0 and Q_0, respectively. P_0 represents the price paid for drinking water prior to the project. Introducing the project causes the supply curve to shift to the right. Price falls to P_1, which is the price of drinking water after the project; total demand increases to Q^d, and the quantity supplied by others is reduced to Q^s. The financial value of the output is Q^sCBQ^d and the economic value is Q^sCABQ^d. The difference (economic - financial) is CAB, which is the sum of two distributional impacts. CAB is the difference between the gain in consumer surplus, P_1P_0AB, and the loss in producer surplus, P_1P_0AC.

Figure 1.

FINANCIAL AND ECONOMIC VALUES FOR PRODUCTION OF NON -TRADED GOOD



In summary, when there are no distortions in a market, the gross value of a non-traded good or service from a project which causes a significant change of the price of the good or service can be decomposed into:

Economic Value of the output = Financial Value of the output + Gain in Consumer Surplus - Loss in Producer Surplus

While the example assumes that there is a market determined price before and after the project, this could just as easily be an illustration of public services such as a road, before and after it has undergone a major improvement. In such a case, P_0 would reflect the time and operation costs (per vehicle-mile) before the project, and P_1 would be the sum of these costs per vehicle-mile after the project.

B. The Case of Non-Traded Good Sold into a Market with a Unit Tax[6]

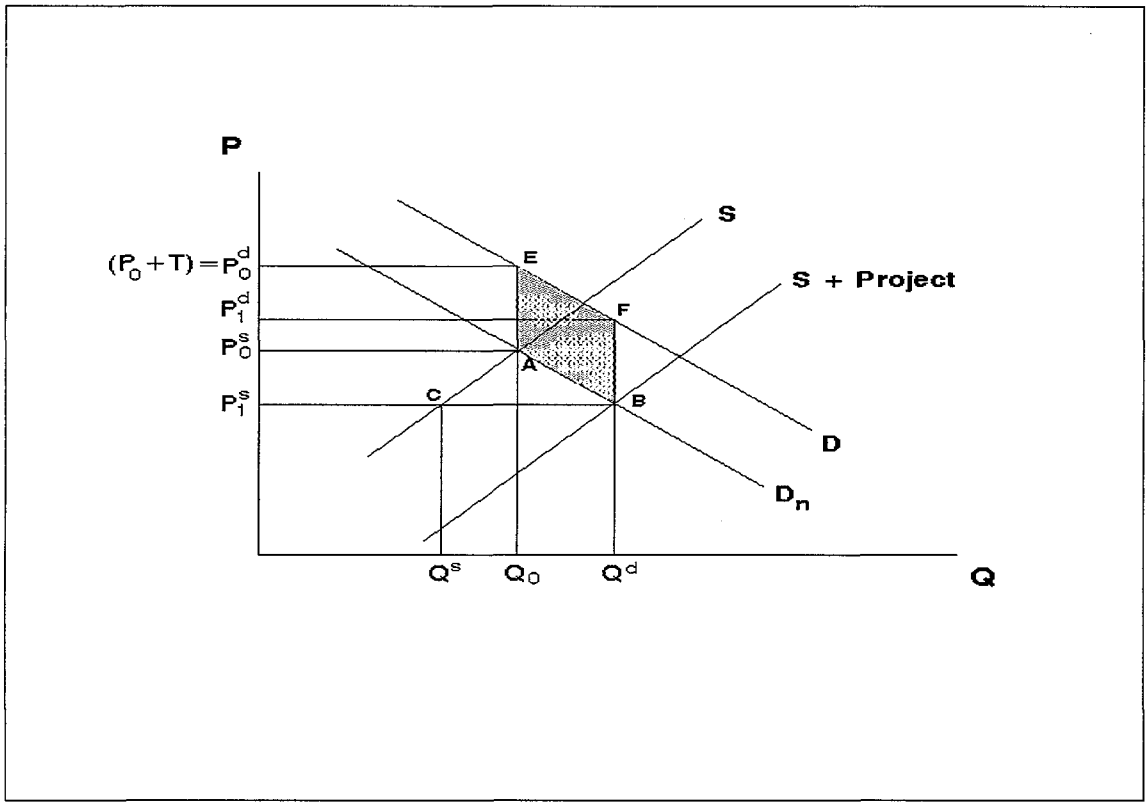
We will now introduce a distortion into the market. Looking at Figure 2, now we have added a unit tax on the non-traded good, which results in the demand curve facing the producer to shift downward to Dn. Before we introduce our project to the market, we have an equilibrium quantity of Q_0, a supply price of P^s_0, and a demand price of P^d_0, which is equal to the supply price plus the unit tax. After we introduce the project, the quantity demanded increases to Q^d, quantity supplied by producers other than the project falls to Q^s, the supply and demand prices fall to P^s_1 and P^d_1, respectively. The financial value of the output is shown as Q^sCBQ^d. The economic value is shown as Q^sCAQ_0 -the value of resources saved through the contraction or postponement of supply by others-, in addition to Q_0ABQ^d plus AEFB, the value to consumers of the increase in the quantity demanded.

The difference between the economic and financial appraisal of the project's output in this case is equal to CAB plus AEFB. Here again, CAB represents the gain in consumer surplus, $P^d_1P^d_0EF$, minus the loss in producer surplus, $P^s_1P^s_0AC$. This is easy to see in the case of a unit tax because $(P^s_o - P^s_1)$ must equal $(P^d_o - P^d_1)$. Hence, the area $P^d_1P^d_0EF$ must equal $P^s_1P^s_0AB$.

The area AEFB is equal to $T(Q_d-Q_0)$ or the net gain in government revenue that results from the increased demand. The gross economic value of the output is therefore equal to the financial value plus the change in government tax revenues plus the increase in the consumer surplus minus the loss in producer surplus. Consumers gain as a result of the lower price of the good. Producers lose because of the fall in price and reduced production; and the government collects more tax revenues, because of the expansion in the quantity demanded due to the lower price.

Figure 2.

FINANCIAL AND ECONOMIC VALUES FOR PRODUCTION OF NON -TRADED GOOD WITH A UNIT TAX



In summary, when the market is distorted only by a unit tax, the gross economic value of the output of a project can be expressed as,

Economic Value of output	=	Financial Value of output + Change in Government Tax Revenues + Increases in Consumer Surplus - Loss in Producers Surplus

C. The Case Of An Importable Input That Is Subject To Tariff

In Figure 3, the case of an importable good is illustrated where the inputs of the item are subject to a tariff at a rate of t. The CIF price is P_w and the domestic price is $P_w(1+t)$. The initial market equilibrium is found at the domestic price of $P_w(1+t)$ where the quantity demanded is Q^d_1 and the quantity supplied by domestic producers is Q^s_1. The quantity imported is $(Q^d_1-Q^s_1)$. The CIF price is P_w. A new project now demands an additional quantity of this item as an input. This addition to demand is shown in Figure 3, as a shift in the market demand curve from D_0 to D_1.

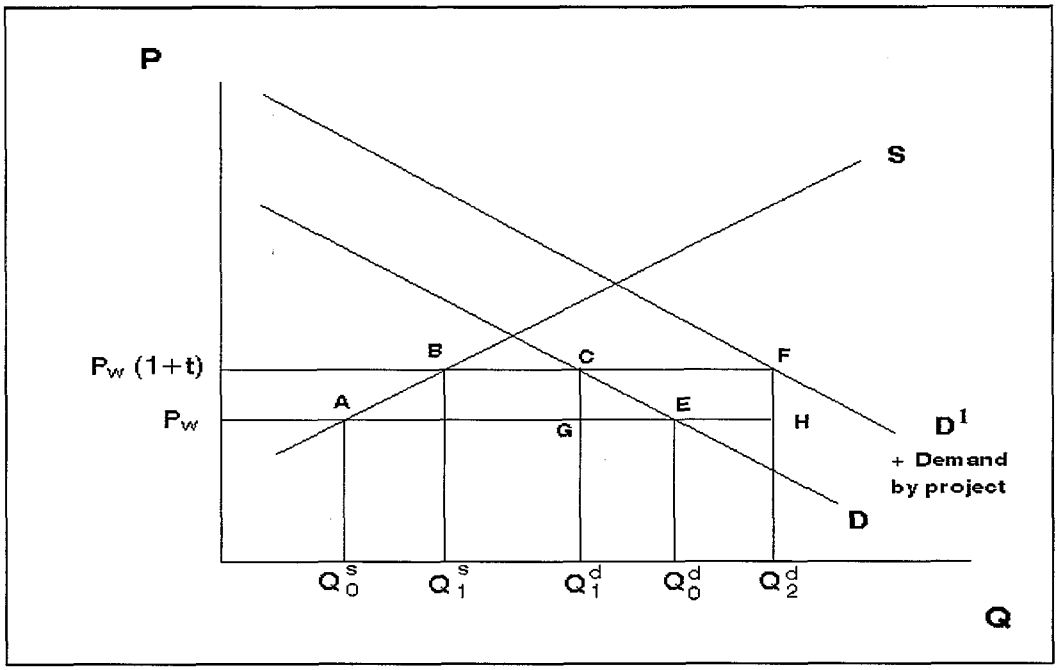
Because it is an importable good, this increase in demand will lead to an equal increase in the quantity of the item imported of $(Q^d_2-Q^d_1)$. The financial cost of the additional imports is $P_w(1+t)$ $(Q^d_2-Q^d_1)$, while the economic cost is equal to $P_w(Q^d_2-Q^d_1)$ (E_e/E_m); where E_e is the economic exchange rate and E_m is the financial market exchange rate.

The difference between the economic and financial costs of the importable good can be expressed as $[E_e/E_m - 1]P_w (Q^d_2-Q^d_1) - t\, P_w (Q^d_2-Q^d_1)$. The first term of this expression is the rate of foreign exchange premium $[E_e/E_m - 1]$ times the cost of the inputs purchased at world prices P_w. This measures the externality, usually tariff revenues foregone, from the use of foreign exchange to purchase the input. Tariff and taxes would have been paid if the foreign exchange required for this purchase had been used to purchase other imports. The second expression is the tariff revenues paid by the project when it imports these inputs.

The net distributional impact on the government is the difference between the two effects. The government gains revenue as a result of the imposition of the tariff, but loses because the use of the foreign exchange elsewhere also would have yielded some tariff revenues. (In the case of a quota, those who have import licenses are the beneficiaries of the premium on foreign exchange).

Figure 3.

MEASURING DISTRIBUTIVE IMPACT FROM FINANCIAL AND ECONOMIC VALUES OF INPUTS WITH TARIFFS



In summary, for the case of an importable good subject to a tariff, the economic cost of the item can be expressed as follows:

Economic cost of importable input = Financial cost – gain to the government from the tariff revenues paid on the purchase of the item +loss in government revenues due to the foreign exchange premium on the foreign exchange used to purchase this input.

D. Integration of Benefits and Costs

If each of the values for the input and output variables that make up a project are broken down into their economic, financial and distributional components, then the end result can be expressed as in equation (1) where the net present value economic is equal to the net present value of the financial outcome of the project, plus the present value of a series of distributional impacts on the various stakeholders of the project. A series of projects are used below to illustrate the use of a distributional analysis in the determination of the ultimate outcome of the project.

5. CASE ILLUSTRATIONS OF INTEGRATED FINANCIAL, ECONOMIC, AND DISTRIBUTIONAL ANALYSIS

The three different cases presented here illustrate how the estimation of shareholder impact is carried out and how the distributional analysis can be conducted for a range of project types. The output of an integrated analysis identifies the key stakeholders to determine if the project promoters are likely to face difficulties in project implementation, if the authorities are likely to be pressured to accept a bad project, or if the project is likely to face risks in its future sustainability.

CASE - 1
Paphos Holiday Complex[7]

The first case we wish to consider is the Paphos Holiday Complex. This is a project that was both innovative and showed great promise. Although it passed both the financial and economic criteria for implementation, it was never built because of local opposition from the other hoteliers in the area. The stakeholder analysis provided a strong indication that this opposition would arise unless the government provided some form of compensation.

Basic Facts

1. The Paphos Holiday Complex is a proposed 5 star hotel resort sponsored by the Cyprus Development Bank in 1990.

2. The project consisted of a main building with 350 rooms and of additional 200 rooms in bungalow type accommodation. The features of the resort included superior sport facilities, extensive landscaping, low construction density, and exclusive personal service.

3. The Paphos complex targeted the upper class segment of the Western European tourism market, and was expected to out-perform its immediate competitors (five 4 star hotels) on comfort and recreational activities. This competitive advantage was considered to be sustainable during the operating life of the project.

4. Because of its competitive edge, the resort was projected to attain a higher occupancy level than its immediate competition, particularly during the low season. In addition, it was anticipated to attract a significant number of people from other hotels in the area during the off-season. The project was also expected to be able to charge marginally higher than average prices for accommodation and food.

5. Implementation of the project was planned to take 4 years with the resort being fully operational in 1994. The project cost at the 1990 price level was estimated at 19.2 million Cyprus pounds (cp).

6. Hotel operating expenses are broken down into eight categories (food, beverage, departmental, fuel, electricity and water, repairs & maintenance, administration & maintenance, and staff costs). Each of these categories has a fixed and a variable cost component. The project staff consists of 370 permanent staff and temporary staff employed during the high season. Payroll costs are the most significant component of the project operating costs.

7. The Paphos Holiday Complex was subject to an income tax rate of 30%.

8. The financial real cost of capital was estimated to be equal to 9.2%.

9. The economic benefits of the project arise from,

    - Incremental guest nights, including:
        - Hotel revenues
        - Taxes paid by tourists
        - Foreign exchange premium associated with tourist spending both inside and outside the hotel; (at that time Cyprus had a rather high average rate of tariff);

    - Non-incremental guest nights.
        - These include the savings from the reduction of the variable costs of competing hotels associated with the non-incremental guest nights.

10. The ratio of the economic exchange rate to the market exchange rate in 1990 was estimated in 1.14 (as a consequence of the level of tariffs.)

11. The economic opportunity cost of capital in 1990 was calculated to be equal to 9.5%.

Project Outcome

Tables 2, 3, and 4 summarize the financial, economic, and distributive analysis of this hotel project. Finally, a reconciliation is made of the economic outcome of the project with the financial outcome and the expected distributional impact.

Table 2

The Paphos Holiday Complex
Financial Appraisal (in '000 CP)
Total Investment Point of View

	PV@9.5%	1990	...1993	1994	1995	1996	...2004
Revenues from operations	42,125			6,630	8,211	9,358	
*** incremental guestnights**	33,307			5,565	6,586	7,316	
*** non-incr. guestnights**	8,818			1,065	1,625	2,042	
Service charge	1,616			248	313	360	
In-use value of assets	2,886						10,282
TOTAL BENEFITS	46,627			6,878	8,524	9,718	10,282
Investment Cost	14,069	2,452	6,023				
Operating Costs	26,901			4,569	5,197	5,687	
Corporate Tax	3,301			69	190	276	
Δ in A/R, A/P and C/B	225			244	109	84	(345)
TOTAL OUTFLOW	44,496	2,452	6,023	4,882	5,496	6,047	(345)
Net Cash Flow	2,131	(2,452)	(6,023)	1,996	3,028	3,671	10,627
NPV Financial @ 9.2%	2,452						
NPV Financial @ 9.5%	2,131						

From Table 2 we find that the financial net present value at a 9.2% discount rate is 2.4 million cp. The cash flow after the project is built is projected to be positive in 1994 and continuously positive through 2003. The net present value when discounted at the economic discount rate of 9.5% is slightly lower at 2.1 million cp. The net present value is evaluated as of the first year of the project, 1990, with all cash flow values presented in the above Tables are expressed in real prices at the price level of 1990.

Table 3

The Paphos Holiday Complex
Economic Appraisal (in '000 CP)

	CF	PV@9.5%	1990	...1993	1994	1995	1996	...2004
Revenues		41,018			6,693	8,064	9,051	
*** incremental guestnights**	1.14	37,970			6,344	7,508	8,341	
*** non-incr. guestnights**	0.35	3,048			349	556	71	
Taxes	1.14	1,648			271	324	363	
Spending outside hotel	0.07	1,176			193	231	259	
Service charge	1.14	1,419			234	280	312	
In-use value of assets	0.98	2,819						10,042
TOTAL BENEFITS		48,079			7,391	8,899	9,985	10,042
Investment Cost	0.97	13,777	2,390	6,004				
Operating Costs	1.008	27,122			4,611	5,242	5,734	
Corporate Tax	-	-			-	-	-	
Δ in A/R, A/P and C/B	0.94	211			227	104	80	(322)
TOTAL OUTFLOW		41,111	2,390	6,004	4,838	5,346	5,814	(322)
Net Benefits		6,968	(2,390)	(6,004)	2,553	3,553	4,171	10,364
NPV Financial @ 9.5%	6,968							

We can see from Table 3 that the economic appraisal indicates that this project is good for the country. The net present value of the economic outcome evaluated, as of 1990, is 6.9 million cp using a real rate of discount of 9.5%. Again the net benefits to the project were expected to become positive after 1994 and remain positive to 2003. From an economic point of view, this project is expected to contribute positively to the overall growth of the economy.

Table 4

The Paphos Holiday Complex
Distribution of Net Benefits (in '000 CP)

	PV Government @ 9.5%	PV Other Hotels @9.5%
Revenues		
*** incremental guestnights**	4663	
*** non-incr. guestnights**	374	-6144
Taxes	1648	
Spending outside hotel	1176	
Service charge	174	-371
In-use value of assets	-67	
TOTAL BENEFITS	7968	-6515
Investment Cost	292	
Operating Costs	-221	
Corporate Tax	3301	
Δ in A/R, A/P and C/B	14	
TOTAL OUTFLOW	3,386	
Net Benefits	11,354	-6515

Table 4 shows the distributional impacts of this project. The values in the Table are obtained by subtracting the present value of the rows in Table 2 from the corresponding present values of the rows in Table 3 and decomposing the differences into the various distributional impacts. In addition to the positive impact that this project will have on the owners of 2.1 million cp, we find that the net fiscal impact accruing to the government is 11.4 million cp. The government gains from this project through a series of taxation impacts. The tourist industry in Cyprus draws tourists from around the world who pay for this service in foreign exchange. There is a foreign exchange premium of 14% which accrues to the government (via tariff revenue) on all incremental sales which are made by this hotel complex. On the non-incremental guest nights we find that there is a slight benefit to the government that comes about because of the higher price which people are willing to pay for this hotel over the other hotels that they would have stayed in Cyprus. At the same time, there is a significant loss of 6.5 million cp that accrues to the other hotels. This arises because the other hotels in the off-season charge a price that is above their marginal cost of operation for the tourists who are expected to now go to the new hotel. Hence, when the guests leave these hotels and move to the proposed Pathos Holiday Complex, there is a loss of profits to the other hotels, equal to the difference between the prices they are paying and the marginal operating cost of the other hotels. The government also obtains

indirect taxes from spending which is made outside the hotel, as well as the corporate income tax being paid by the hotel.

Using equation (1), we can summarize the previous tables as follows:

$$NPV^{ECO}{}_{eco} = NPV^{FIN}{}_{eco} + PV^{EXT}{}_{eco}$$

$$6{,}968 = 2{,}139 + (11{,}354 - 6{,}515)$$

While this hotel has a positive financial net present value of over 2 million cp, we find that it has two very significant distributional impacts. The government will receive 11.3 million cp, while other hoteliers in the region will lose 6.5 million cp. In a relatively small country such as Cyprus, the political pressures that can be exerted by competing hoteliers are very strong. As a result, this hotel was the subject of controversy and has not been built to date. Although the government could have compensated the other hoteliers for their losses, it chose not to do so, perhaps for very good political-economic reasons. At the same time, the owners of the proposed hotel were not making sufficient profits to be able to compensate the other hoteliers. This reconciliation of the economic, financial and distribution analysis gives us a very clear picture of the position of the various stakeholders affected by this project. With this knowledge, the analyst could either redesign the flow of benefits and costs to the various stakeholders so the project can go forward, or recommend removing this project from active consideration at an early stage.

CASE - 2
Linking East and West Bangladesh: The Jamuna Bridge Project [8]

Basic Facts

1. The Bangladesh government proposes to build a bridge over the Jamuna River.

2. At present, the ferry service is poor, creating delays ranging from one to eight hours for light vehicles to 30/40 hours for heavy vehicles.

3. The economic benefits arise from the savings in vehicle operating costs and reduced waiting times plus the willingness to pay by newly generated traffic (as given by the tolls they are willing to pay). Financial revenues will arise from the tolls charged. This bridge will not only facilitate the transport of passengers and freight, but will also enable natural gas, electricity, and telecommunication links to be made across the river.

4. As part of the financial and economic analysis, the option of improving the existing ferry service was considered.

5. The bridge is expected to facilitate economic growth within the country by improving the links between the relatively more developed region east of the Jamuna River and the agricultural region to the west.

6. The project is expected to cost approximately US$700 million. Approximately $600 million of loans were given by bilateral and multilateral agencies to the Government of Bangladesh at a nominal interest rate of 1%. The rest of the financing was provided as a grant by the government.

7. Implementation of the project began in 1996.

Project Outcome

An economic analysis was performed to determine whether the project would be beneficial to the overall economy of Bangladesh. The analysis revealed that as compared to the existing ferry system, the real economic NPV of the bridge project is 7.77 billion Takas (US$ 195 million).[9]

Comparing the financial profitability of the bridge project (with the specified set of tolls) with the existing ferry system indicates that the financial NPV of the bridge project is a positive 1.07 billion Takas (US$ 27 million).

When comparing the economic and financial analysis of this project, we find that the major net beneficiaries are the truckers, the producers and consumers of cargo, the power company and the bus passengers. On the other hand, both the government and aid agencies as well as the ferry operators lose. Truck operators, shippers and consumers would realize savings of about 31.09 billion Takas, while bus passengers and light vehicle owners and passengers would gain only 1.95 and 0.63 billion Takas respectively. The present ferry operators would incur a negative financial impact amounting to 1.84 billion Takas. The following table summarizes the distributive analysis of this project.

Table 5

Jamuna Bridge: Distribution of Project Net Benefits
(million of 1994 Takas)

	Light Vehicles Passengers	Bus Passengers	Truckers, Producers and Consumers of Cargo	Power Company	Government and Aid Agencies	Locality	Ferry Operators
	627	1951.6	31094.1	2544.3	-27700.7	456.9	-1840.8
Total	7132.3						

Using Equation (1), we can summarize the analysis of this project as follows,

$$NPV^{ECO}{}_{eco} = NPV^{FIN}{}_{eco} + NPV^{EXT}{}_{eco}$$

yielding,

$$7774.9 = 642.5 + 7132.3$$

A key feature of this project was the large amount of subsidized financing it received. As a consequence of these subsidies we find that, from the distribution analysis, that the total subsidies amounted, in present value terms, to -27,700 million Takas. This is a result of the interest subsidy on the loan (19,851 million Takas), the government grant (2,455 million Takas) and the premium lost on the foreign exchange used to purchase traded goods components of the investment cost of the bridge (5,358 million).

On the other hand, we find that truckers, shippers and consumers who are going to benefit from the lower transportation cost of the cargo to the amount of 31,094 million Takas, which is more than the entire investment cost of the bridge.

These results would indicate that if a tariff structure were designed that would capture the benefits of which were received by the consumers and producers of the cargo, little or no subsidy would have been needed. Perhaps for economic development and distributional reasons, it would be desirable to allow the users of the bridge to receive a substantial portion of the benefits from the bridge. In a country like Bangladesh, however, there are many pressing social and economic needs which are not being met due to a scarcity of resources. Perhaps the overall development impact of these $600 million of low cost loans might have been greater if a somewhat less subsidy had been provided to the Jamuna Bridge Project. The funds might have been better used to subsidize other public investments, such as education and health, where the application of user fees may be more difficult to implement than in the case of a bridge.

When considering the potential sustainability of this bridge, in terms of maintenance and construction of access roads, it is clear that sufficient funds could be generated by tolls to cover these costs. For this bridge, the maintenance of the river training infrastructure and the construction of access roads will be critical for the success of its long term operation.

CASE - 3
Port Rehabilitation and Expansion: The Makar Project[10]

Basic Facts

1. Makar Port, located in General Santos City at the northern side of Sarangani Bay, a well-protected bay in Mindanao, lies along the main north-south trading axis which skirts Mindanao on its western shore.

2. The objectives of the project are to increase the capacity and improve the efficiency of cargo handling facilities at the port to accommodate future flows.

3. The project will cost approximately 635 million pesos.[11]

4. Seventy-five percent of the total project cost will be provided as a grant by the US Agency for International Development (USAID) and the other 25% will be provided from counterpart contribution by the Philippine government.

5. User fees are charged in order to cover the cost of running the port.

Project Outcome

The results summarized in Table 6 show that the project can not be recommended using either the financial or economic net present value criterion. The comparison of the with and without project situation shows that on an incremental basis, the project is a waste of economic resources and creates a loss in net financial cash flow. The project, however, was implemented.

Table 6

Makar Port Project Financial and Economic Outcomes

	With Project (000s Pesos)	**Without Project (000s of Pesos)**	**Incremental (000s of Pesos)**
NPV (Total Investment Point of View)	13,354	47,243	(33,889)
NPV (Economic Point of View)	(101,558)	64,451	(166,009)

This case is of particular interest because the initial appraisal done for USAID was carried out by only examining the combined project and only from a financial point of view. When we consider that scenario, we find that the financial net present value is 13.4 million pesos. However, when we look at the financial net present value of the existing facility without the project, it has an NPV financial of 47.2 million pesos, giving us an incremental net present value financial to the new project of minus 33.9 million pesos. From a financial point of view, this project is clearly not warranted. It would not be undertaken by a rational private sector investor.

The economic analysis shows that the project is a clear disaster. The economic net present value of the combined project is -101.6 million pesos, as compared to the base case (without project) which has an economic net present value of 65.5 million pesos. Hence, the incremental net present value economic is -166.0 million pesos.

Although the projected performance of this project from both an economic as well as financial point of view is truly dismal, this project was implemented. We might want to ask why was such a bad project implemented? The reason for this is much clearer when we look at the results of the distributive analysis of the project. While both the financial and economic net present values are negative, we find that the users of this project – as shown in table 7- are receiving substantial, positive net benefits.

Table 7

Makar's Distributive Analysis of Incremental Cash Flows.

	Government	Shipowners/Customers	NPV of the Benefits to Port Authority @ econ. discount rate
USAID Grant	-402,345		
Other	13,485		
Reduction in ship's waiting time		183,816	
Reduction in animal's weight loss		75,277	
Other		1,437	
Subtotal	-388,860	260,530	-37,679
TOTAL	**-128,330**		

The ship owners and the consumers of the services of this port will receive a total positive net present value of 260.5 million pesos. In effect, shipowners gain 184 million pesos from the savings due to reduced ship's waiting time; livestock shippers would save about 75 million pesos from the reduction of animal weight loss, while port revenues generated would be around 1.43 million pesos. Other customers would gain from the competitive nature of inter-island shipping industry.

The losers of this project are those living in the rest of the country. The Philippines Government is using this USAID grant of 402.3 million pesos to subsidize this project rather than putting it to better use elsewhere, while only 13.4 million pesos came from other sources. Overall, the present value of the externalities is a negative 128.3 million pesos.

A reconciliation of the financial, economic and distributive analysis is performed by applying equation (1)[12]

$$NPV^{ECO}{}_{eco} = NPV^{FIN}{}_{eco} + PV^{EXT}{}_{eco}$$

yielding,

$$-166{,}009 = -37{,}679 + -128{,}330$$

There was no doubt it was strong political pressure from this region that persuaded the authorities to go ahead with this project, even though its overall benefit to the country is negative.

6. CONCLUSIONS

The type of integrated financial, economic and distributive analysis proposed in this paper has a number of advantages for evaluating both public as well as private sector investments. First, it assures that the economic and financial analyses are done in a consistent manner. If the economic and the financial analyses are done correctly, then the differences will be equal to a series of distributional impacts that can be identified and measured. Hence, the possibility of error in completing the analysis will be substantially reduced.

Second, the clear identification of the stakeholders and how they will fare as a consequence of a project is a key ingredient in determining the likelihood of its successful implementation, as well as in causing the authorities to consider redesigning the project so that the impact on the stakeholders is more favorable. Although most projects will have negative impacts on some segments of the population, if they are clearly identified and their political strengths assessed, the chances of surprises and stalled implementation may be substantially reduced.

Third, this analysis can also be used to identify the likely impact that this project will have on the incidence of poverty in particular groups. For example, in the case of the Jamuna Bridge, the consumers and producers of the cargo that will be transported across the bridge will be given a substantial benefit due to the subsidized nature of the tolls, which are to be charged on cargo. Similarly, the producers of cargo who use the Mindanao Port may receive some benefits from the fact that there will be smaller weight losses by the animals when they are transported to market.

Such an analysis may not address all the questions of a political economy nature in determining what projects should be selected and implemented, but at least it is a quantitative basis for making judgments as to the attractiveness of the project, and provides the basis for assessing the roots of support and opposition that the project is likely to receive.

If projects are to be sustainable, it is likely that they should not be subject to continued political pressure for their suspension. The stakeholder analysis which we undertake through the comparison of the economic and financial outcomes provides us with a clear signal of the groups which are likely to promote and those which will not favor this project. In addition, if the project inflicts a continuous fiscal drain on the public sector budget, it is likely to be at some risk in terms of its long-term sustainability. Through the identification of the fiscal and stakeholder impacts of the project, this analysis assists us in being able to make a more realistic assessment of its long-term sustainability.

ENDNOTES

[1] This issue has been identified as a major reason for development assistance by the World Bank. Please see James D. Wolfensohn (President, The World Bank Group): "The Challenge of Inclusion," address to the Board of Governors. Hong Kong, China, September 23rd, 1997.

[2] Ward, William A. and Deren, Barry J. "Choosing Numeraires and Decision Criteria: Practicality and Sensitivity," *The Economics of Project Analysis*. Washington, DC, The World Bank, 1991, pp. 129-138.

[3] Jenkins, Glenn P., "Project Appraisal and the World Bank," *American Economic Review*, May 1997.

[4] Belli, Pedro, J. Anderson, H. Barnum, J. Dixon, J.P. Tan, "Handbook on Economic Analysis of Investment Operations," World Bank, Washington DC, 1996, Chapter 2.

[5] Harberger, Arnold C., "Economic Project Evaluation: Some Lessons for The 1990s," *Canadian Journal of Program Evaluation*, 1997.

[6] Little, I.M.D. and J.A. Mirrlees, *Project Appraisal and Planning for Developing Countries,* New York: Basic Books, 1979 and 1982.

Dasgupta, P., S.A. Marglin and A.K. Sen, *Guidelines for Project Evaluation,* New York: United Nations, 1972.

[7] The illustration in this case is for a unit tax, but the same results also hold for ad-valorem taxes imposed on goods or services.

[8] Andreas Andreou, Glenn P. Jenkins and Savvakis Savvides: "Tourism, Environment and Profitability: The Case of the Paphos Holiday Complex," HIID Development Discussion Paper #330, November 1989.

[9] Glenn P. Jenkins and Gangadhar P. Shukla: "Linking East and West Bangladesh: The Jamuna Bridge Project," *The Canadian Journal of Program Evaluation*, Special Issue 1997, pages 121-145.

[10] In 1994, the exchange rate was 39.8 Takas/1US$.

[11] Glenn P. Jenkins and Pastor Lorenzo, Jr.: "Port Rehabilitation and Expansion: The Makar Project in the Philippines," Harvard Institute for International Development, December 1994.

[12] Peso is the Philippine currency and in Year 1 is equal to .037 US dollar (1994).

[13] The financial net present value (@ financial discount rate) is equal to $NPV^{FIN}_{fin} = -33{,}889$

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1. Andreou Andreas, Jenkins, Glenn P., and Savvides Savvakis: "Tourism, Environment and Profitability: The Case of the Paphos Holiday Complex," *HIID Development Discussion Paper #330*, November 1989.

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