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PI/PN2 = 400

EN = 50,000

HANDBOOK OF PRIVATE AND ECONOMIC PROFITABILITY ANALYSIS

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Chapter 1

Introduction

This is a handbook for measuring private and economic profitability. Profitability quantifies the ability to generate revenue (income from sale of output) in excess of the cost of the inputs (e.g., fertilizer, cement, tools, etc.) and factors of production (land, labor, capital) used in the production of a particular good (output).

Private profitability analysis focuses on particular productive units such as a farm or a firm, and utilizes actual market prices to value inputs, factors of production, and output.

The focus of economic profitability analysis is different from that of private profitability analysis: It looks at profitability from the viewpoint of the nation, rather than from the point of view of the enterprise. It measures economic profitability, which is an indicator of economic efficiency or comparative advantage. It utilizes economic prices (opportunity costs) to value outputs and inputs.

This handbook shows how private and economic profitability analysis can provide answers to the following questions which are of interest to both policymakers and to private sector producers:

1. From the viewpoint of the producer, how (**privately**) profitable is production of a particular good for export or for the domestic market? How sensitive is this profitability to changes in various government policies, such as changes in the exchange rate, interest rate, minimum wage legislation or changes in tariffs or taxes?

2. From the viewpoint of the nation, how (**economically**) profitable is production of a particular good? If an activity is economically profitable or efficient, it will save or earn foreign exchange. By using economic profitability analysis, policymakers can identify those activities that are most economically profitable and introduce or alter policies in order to provide these activities with positive incentives. By so doing, foreign exchange earnings or savings can be maximized.

3. How are producers affected by the existing mix of government policies? That is, are the government's exchange rate, tax, labor, and investment policies providing positive or negative incentives to a particular producer? Are some policies having a positive effect on private profitability, and others a partially or entirely negative effect? Does the effect differ significantly by type of producer? For example, are producers of import substituting products positively affected by government policies and producers of exports negatively affected? Are economically efficient firms receiving negative incentives?

Or equally inappropriate, are economically inefficient firms receiving positive incentives? How might more appropriate policies be designed and implemented?

The second chapter of this handbook presents the methodology in clear simple terms, designed to be understood by the non-economist. The methodology is of interest both to private sector entrepreneurs and to government policymakers.

The third chapter guides the reader through the process of carrying out private and economic profitability analysis for one activity--the export of flowers. It is designed to enable the reader to actually carry out each stage of the analysis for a particular activity of interest.

For example, to determine how profitable an activity is under different economic environments (e.g., higher exchange rate, minimum wage increase, trade restrictions, etc.), a private sector agriculturalist or manufacturer might wish to carry out the analysis for his particular farm or firm. A government policymaker may wish to carry it out in conjunction with a particular firm or sector that has come to it requesting assistance, such as access to a particular line of credit, a reduction of existing import duties or a prohibition of imports of the product that the firm plans to manufacture.

As Chapter 3 will show, the first stage of the analysis is to obtain the required data. This can be done by using the

questionnaire included in the case study materials as a guide. The second stage is to input the data into a microcomputer using the spreadsheet software Lotus 123. A computer file with all the required formulas is also included in the case study materials. The third stage is the presentation of the findings and their interpretation. A detailed guide is provided of how the results can be interpreted and presented to government policymakers.

The final chapter provides guidelines on how one can present the results of private and economic profitability analyses which have been carried out for a number of different activities. The first section discusses the results for 7 nontraditional export firms in Ecuador. The second section discusses the results of a much more comprehensive study of the manufacturing sector in Zimbabwe. This gives the reader some understanding of the sample size required in order to provide policymakers with results representative of various subsectors of an economy. It also provides an indication of the extent to which results can vary between activities in an economy.

Chapter 2

The Methodology of Private and Economic Profitability Analysis

A. Objectives

As the introductory chapter has pointed out, private and economic profitability analysis serve different objectives and utilize different methodologies.

Private profitability analysis attempts to determine the profitability of activities such as production of a hectare of wheat, or assembly of a sewing machine. This is a relatively straightforward exercise and focuses on actual market prices, whether these be government-administered or freely determined by supply and demand.

The question addressed is how privately profitable are various activities. If it is assumed that private sector producers are interested in maximizing their profits, they will allocate their resources (to the extent the government allows them to) to the production of those goods with the highest profitability.

If a government wishes to encourage the production of a certain good it can do so by increasing its profitability-- normally either by implementing policies that increase its price on domestic sales and/or by subsidizing its costs of production.

Conversely, if the government wishes to discourage the production of a certain good it can do so by lowering its profitability --normally either by implementing policies that decrease its price on domestic sales and/or by imposing taxes on its inputs. It thus follows that from the viewpoint of a private entity, a government policy is considered beneficial if it results in an increase in its profits; it meets disapproval if it will have a negative impact on profitability.

These policy considerations lead directly to the focus of economic profitability analysis: to the determination of the production of which goods should be encouraged or discouraged by government.

Economic profitability analysis is less straightforward than private profitability analysis. While one can safely make the simplifying assumption that the main objective of private sector farmers or firms is to maximize profits, the government's objectives are usually more difficult to ascertain.

Governments often have a number of objectives, some of which may be at least partially conflicting (e.g., a high rate of economic growth and a more equal distribution of income). As a result, there are a number of possible criteria or yardsticks to be used in economic profitability analysis.

In order to identify the appropriate criterion to be used in assessing the effects of government policies from the point

of view of the nation, it is necessary to identify the government's objectives. This is because we can assume that the government will be satisfied with policies whose effects are to further its objectives, but that it will wish to discard policies whose effects do not further its objectives.

For the purpose of economic profitability analysis, it is useful to consider the multiple objectives of most governments in the following way. First, the achievement of economic efficiency is considered as the principal objective. Then other government objectives, such as full employment, equity, or more regionally balanced growth are analyzed by calculating the loss in economic efficiency that would be incurred in reaching various levels of attainment of these other objectives.

Economists can estimate the allocation of resources that will maximize economic efficiency. This will result in the highest attainable level of output, given the country's available resources and present level of technology. Once this has been determined, one can then examine this allocation and decide what modifications are required in order to make the desired rate of progress in achieving other objectives.

Suppose, for instance, that the most efficient allocation of resources will result in a total output (GDP) valued at Sucres A and a total wage bill of Sucres B shared by a number of C employees. Government policymakers can then examine this

result and decide whether they wish to sacrifice some growth in output [A] in order to provide more employment [C] or higher wages [B]. But if the government does not have a base case of the economically efficient solution with which to compare alternatives, it cannot make a clear judgment as to whether the sacrifices or costs of the loss of efficiency (output), are worth the gains or benefits in terms of progress in achieving higher wages, full employment, or other objectives. In other words, this approach allows one to assess the tradeoffs required between promotion of conflicting objectives--the most important ones typically being economic growth and distributional equity.

B. Policy Analysis Matrix (PAM)*

This section explains the construction of the **Policy Analysis Matrix (PAM)** which is used to measure private and economic profitability. It provides the basic framework for efficiency analysis. The main task is to construct accounting matrices of revenues, costs and profits.

A separate **PAM** will be constructed for the analysis of selected activities--such as production of flowers for export, or production of wheat for the domestic market. Table 1 on the next page presents the policy analysis matrix (**PAM**).

* This section draws heavily on an approach developed by Scott Pearson of the Food Research Institute at Stanford University.

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Table 1

```

*****
*
*           Policy Analysis Matrix (PAM)
*
*           -----Costs-----
*
*           Revenue      Tradable      Domestic
*           (1)         inputs         factors      Profits
*
*
*           1. Private Prices      A           B           C           D
*
*           2. Economic Prices     E           F           G           H
*
*           3. Effects of Policy I   J           K           L
*           & market imperfections
*
*****

```

where:

$$D = \text{private profitability} = A - B - C$$

$$H = \text{economic profitability} = E - F - G$$

Effects of Policy and
Market Imperfections on:

$$I = \text{outputs (revenue)} = A - E$$

$$J = \text{tradable inputs} = F - B$$

$$K = \text{domestic factors} = G - C$$

$$L = \text{net effect} = D - H, \text{ or } I + J + K$$

=====

As shown, the PAM consists of four columns and three rows. Column 1 is revenues, column 2 is tradable input costs, column 3 is domestic factor costs (labor, land, and capital), and column 4 is profits.

Two basic accounting formulas underlie this matrix. The first basic formula of the PAM is stated as follows:

- [1] Profits (column 4) are equal to the difference between revenues (column 1) and costs (column 2 and column 3).

Thus, the elements of the first and second rows of the PAM are defined as follows:

$$D = \text{private profitability} = A - B - C$$

$$H = \text{economic profitability} = E - F - G$$

1. Private Profitability [Row 1 of the PAM]

The first row of the PAM shows that private profits [D] are equal to revenues in private prices [A], minus tradable inputs in private prices [B], minus domestic factor costs in private prices [C]. Private profitability can then be defined as the difference between revenues at private (actual market) prices and all costs at private prices [D = A - B - C].

The normal cost of capital, defined as the minimum after-tax return that owners of capital require to maintain their investment, is included in domestic factor costs [C]; hence profits [D] are excess profits, or above-normal returns to operators of the activity. If private profitability is negative [$D < 0$], operators are earning a subnormal rate of return and so can be expected to quit this activity unless something changes to increase profits at least to a normal level [where $D = 0$]. Alternatively, positive private profits [$D > 0$] are an indicator of above-normal returns and should lead to future increases of investment in the activity.

To compute private profitability, revenues and costs must be valued at actual market prices, normally for the most recent year for which farms and firms have this data available in their accounts. Calculation of private profitability for a particular year is thus fairly straightforward.

Let us illustrate this with an example: In 1987 Big Foot Shoe Co. obtained revenue of Sucres 7 million from the sale of shoes it manufactures. It incurred costs of Sucres 2 million for the purchase of tradable inputs (such as leather, dyes, nails, shoe polish, etc.), and costs of Sucres 1 million for its expenditures on domestic factors (land, labor and capital). What was Big Foot Shoe's private profitability? As can be seen from row 1 of the PAM below, it was Sucres 4 million, which is

[D = A - B - C]. Big Foot had an "above-normal" profit of Sucres 4 millions.

=====

PAM for Big Foot Shoe Company

		-----Costs-----		
	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
1. Private Prices	A = 7	B = 2	C = 1	D = 4

=====

2. Economic Profitability [Row 2 of the PAM]

The second row of the PAM contains economic prices. The term economic refers to valuations that attempt to measure comparative advantage or efficiency. Efficient outcomes are attained when an economy's resources are used in activities that create the highest levels of output and income. The PAM approach measures the distorting effects of policies and market failures that interfere with efficient outcomes.

Economic profitability, defined as [H] in the second row of the PAM, is an efficiency measure because outputs [E] and inputs [F and G] are valued in prices that reflect scarcity values or opportunity costs. Economic profits, like

its private analogue, is the difference between revenues and costs, all measured in economic prices [$H = E - F - G$].

Economic prices are prices that reflect underlying scarcity values or opportunity costs. These economic (or efficiency) prices, if hypothetically introduced, would result in the optimal allocation of scarce resources and thereby maximize efficiency and generate the highest attainable level of national income. The primary task with efficiency analysis, therefore, is to find reasonably accurate approximations for the economic prices of output and inputs.

For commodities that are traded internationally, the appropriate economic prices are the world prices. For imports, the c.i.f. import prices (cost, insurance, freight), and for exports, the f.o.b. export prices (free on board). The logic is that government officials always have the option of setting policy that will permit more imports or exports at world price levels, even though they presently may restrict imports and exports and thus choose not to exercise this option. World prices provide a relevant standard of comparison and establish economic valuations for tradable outputs and inputs.

The f.o.b. export price is a correct measure of the economic return for each unit of output produced by an exporting activity. For example, if one additional ton of domestic production of peas is under consideration, its economic value to

Ecuador is given by the export revenue that the country would earn by exporting that ton of peas. Likewise, the c.i.f. import price of fertilizer provides an economic valuation of the costs of fertilizer used in the domestic production of peas; hence material inputs are valued in the same manner as outputs.

It should be noted that even if an input (e.g., cotton) is produced domestically for sales only on the local market, it should still be valued in economic prices at the c.i.f. import price, as long as this particular item can be considered a tradable. This is because the government always has the option of importing cotton at the c.i.f. import price.

A tradable product is defined as a good or service which is traded internationally, even if the country may not presently engage in this trade, perhaps due to government policies that tax or prohibit its import, or subsidize its domestic production. There are two types of tradables: **exportables** and **importables**.

A tradable is considered an **exportable** if the domestic supply of the good or service is greater than its domestic demand, so that the excess supply is available for export at the f.o.b. export price. A tradable is considered an **importable** if the domestic supply of the good or service is less than its domestic demand, so that the unsatisfied demand can be met by imports to be valued at the c.i.f. import price. Thus, if a product is an exportable, its economic price is its f.o.b.

export price; if it is an importable, its economic price is its c.i.f. import price.

The following example illustrates the estimation of economic prices for a firm's tradable outputs and costs. Woodchuck Lumber has revenues of Sucres 1,000 per year from its exports of particleboard. The government, wishing to encourage nontraditional exports gives the firm an export subsidy of 10 percent. One of the most important components of particle board is resin, of which this company imports 100 gallons per year. The c.i.f. import price is Sucres 3 per gallon. There is an import duty of 20 percent on resin. What are Woodchucks' revenues and tradable input costs in private and economic prices? Compare your answers with those given in the PAM below.

=====

PAM for Woodchuck Lumber Company

		-----Costs-----		
	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
1. Private Prices	A = 1100	B = 360	C	D
2. Economic Prices	E = 1000	F = 300	G	H

=====

Private prices reflect the actual amounts that Woodchuck earned on its sales (revenues)--including government subsidies and the actual costs it incurred--including government taxes.

Thus, revenue in private prices [A] is Sucres 1,000 from sales, plus Sucres 100 from the government subsidy, or a total of Sucres 1,100. Tradable input costs [B] is the c.i.f. import price of resins, Sucres 300 (100 gallons times Sucres 3), plus the import duty of 20 percent on resins (300 times .2), Sucres 60, for a total cost of Sucres 360.

By contrast, economic prices exclude taxes and subsidies since these are merely transfers and do not represent an actual use of scarce resources. Revenues in economic prices [E] is simply Sucres 1,000, obtained from sales at the f.o.b. export price, and tradable input costs in economic prices [F] is simply Sucres 300, the c.i.f. import price of resin (100 times 3).

A nontradable product is a good or service that is not traded internationally, such as security services, water, buildings or hot fudge sundaes. Most nontradable products are not traded internationally because they are perishable or have an extremely low value to weight ratio.

For goods that are not traded internationally, one cannot use world prices as the appropriate economic prices, since they do not exist. Most of these goods contain, however, tradable and factor cost components. The nontradable good can then be valued by separately valuing its tradable and factor cost components, the two cost categories in the PAM. For example, security services, a nontradable, consists of the cost of the

security guard's gun (the tradable component), and his wage (the factor cost component). One then values the tradable component (gun) at its world price and the factor component (wage) at its opportunity cost (see following discussion).

Domestic factors of production--land, labor, and capital--are valued at their opportunity costs. The concept of opportunity cost is a basic economic concept and is defined simply as the value of something in its next best alternative use. For example, the security guard who is working for GUN Security for Sucre 5,000 per day, knows that his next best job would be washing dishes for Sucre 4,500. His opportunity cost is thus Sucre 4,500. If GUN Security knew this, they could hire him for Sucre 4,500 (assuming he is indifferent between washing dishes or being a security guard if the pay is the same). But GUN Security may choose to continue to pay him Sucre 5,000--perhaps they are required to do so because the government's minimum wage for security guards is Sucre 5,000.

=====

PAM for GUN Security Services

	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
1. Private Prices	A	B	C = 5000	D
2. Economic Prices	E	F	G = 4500	H

=====

Thus in terms of our matrix, the value of factor costs in market prices [C], is Sucres 5,000. By contrast, the value of factor costs in economic prices [G], reflecting opportunity costs, is Sucres 4,500.

The basic idea underlying the concept of opportunity cost is that scarce factors provide valuable services in production; the opportunity cost of each factor is a measure of that scarcity because it shows the cost to society of utilizing the factor in one activity rather than another.

As another example, a firm making furniture may have in its factory woodcutting machinery valued in current market prices at Sucres 500,000. The opportunity cost of using that machinery each year in its production is the interest it foregoes by having that amount of money tied up in machinery rather than in the form of a certificate of deposit earning the highest interest rate available, let us say 30 percent per annum. The capital cost in economic prices is 30 percent of Sucres 500,000 or Sucres 150,000 for a calendar year. However, the firm received a subsidized loan from government to purchase this machinery at an interest rate of only 20 percent. As a result, in market prices its capital costs are 20 percent of Sucres 500,000 or Sucres 100,000 (see the PAM on page 19).

The economic prices of domestic factors [G] are given by determinations of opportunity costs, which are reflective of

underlying supply and demand conditions in the market for domestic factors (capital, labor, or land). For any given year, these economic prices are largely immutable by either macroeconomic or commodity policies. As it is being shown, the government can, however, enact tax or subsidy policies on one or more of the factors which create a divergence between costs in private prices [C] and costs in economic prices [G].

=====

PAM for Furniture Firm

		-----Costs-----		
	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
1. Private Prices	A	B	C= 100,000	D
2. Economic Prices	E	F	G= 150,000	H

=====

Once the revenues and costs have been valued in economic prices, the calculation of economic profitability follows easily. With reference to the symbols of the PAM, the economic prices of tradable output [E] and of tradable inputs [F] are given by their c.i.f. import or f.o.b. export prices. The economic valuations of factors [G] are their opportunity costs, and economic profitability [H] is the difference between revenues and costs in economic prices [$H = E - F - G$]. If economic

profits are positive, the activity is competitive at world prices and thereby is an efficient user of scarce resources and a positive contributor to national income.

An economic activity can only save or earn foreign exchange if it is economically profitable, because this efficiency measure is an indicator of the ability of the activity to use domestic resources [G] to generate foreign exchange [E - F]. So long as domestic factors are scarce, their costs need to be included in evaluating foreign exchange effects. Therefore, actual foreign exchange saving is [E - F - G], which is identical to economic profitability. It is thus incorrect to ascribe extra benefits to foreign exchange savings or earnings. If an activity is efficient, it will save or earn foreign exchange; if it is inefficient, it will not.

3. Exercise 1: Calculation of Private and Economic Profitability

The following provides sufficient information to calculate private and economic profitability for wheat production. After reading the paragraph, the reader should fill in the six data points of the PAM provided below, and calculate private and economic profitability (the completed PAM is shown on page 27).

The government sets the producer price of wheat at Sucres 2,500 per bag, while the c.i.f. import price is only Sucres 2,000

per bag. The c.i.f. import price of fertilizer that is used in wheat production is Sucres 1,000 per bag, but the government imposes a 30 percent import tariff on fertilizer imports. In addition, the government has established a minimum wage for farm labor of Sucres 700, while the opportunity cost of such labor is only Sucres 600. What is the private and economic profitability of a farmer who uses one laborer, one bag of fertilizer and no capital to produce one bag of wheat?

=====

PAM for Wheat Production Exercise

		-----Costs-----		
	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
1. Private Prices	A =	B =	C =	D =
2. Economic Prices	E =	F =	G =	H =

=====

4. Effects of Policy [Row 3 of the PAM]

There is a close relationship between the calculation of economic profitability and the measurement of the effects of policy, as shown in the third row of the PAM. This relationship is defined by the second basic formula of the PAM:

[2] The difference between any item (revenues, costs, or profits) in row 1 and in row 2 equals the effect of government policy or market imperfections (row 3).

Thus, the elements of the third row of the PAM are defined as follows:

=====

Policy Analysis Matrix (PAM)

		-----Costs-----		
	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
1. Private Prices	A	B	C	D
2. Economic Prices	E	F	G	H
3. Policy Effects	I	J	K	L

where:

$$I = \text{effect of policy on output} = A - E$$

$$J = \text{effect of policy on input costs} = F - B$$

$$K = \text{effect of policy on domestic factor costs} = G - C$$

$$L = \text{net effects of policy} = I + J + K, \text{ or } D - H$$

=====

For each entry in the matrix--measured vertically down the columns--any difference between the observed value in private prices (actual market prices) and the value in estimated

economic (efficiency) prices is explained by the effects of policies or by the existence of market failure. This critical relationship of policy analysis follows directly from the concept of economic prices.

As we saw in the previous section, to estimate economic prices one corrects for the effects of distorting policies, those that lead to an inefficient use of resources and thus lower than potential levels of income. Distorting policies are often introduced because policymakers are willing to accept some inefficiencies (and therefore slower growth of income) to further nonefficiency objectives, such as reduction of income inequality or more regionally balanced growth. Assessing the tradeoffs between efficiency and nonefficiency objectives is a central part of policy analysis.

Market imperfections or market failures can also lead to a difference between values in private prices and in economic prices.* Market failures occur whenever monopolies or monopsonies (seller or buyer control over market prices), externalities (costs for which the imposer cannot be charged, or benefits for which the provider cannot receive compensation), or factor market imperfections (inadequate development of institutions to provide competitive services and full information),

* Since in most countries market failures largely result from government policy, we shall use the term **effect of policy** as a shorthand notation for "effects of policy and market imperfections."

prevent a market from creating an efficient allocation of products or factors.

Often the difference between a value in private prices (row 1) and in economic prices (row 2) results from a combination of distorting policies and market imperfections. For example, let us assume that there is only one company producing fertilizer domestically (a monopoly producer = market imperfection). The government prohibits imports of fertilizer in order to protect this local firm (import ban = distorting policy). The fertilizer company charges farmers Sucres 180 per bag because it knows that farmers do not have the option of importing fertilizer at the c.i.f. import price of Sucres 100 per bag. In this case, the cost of tradable inputs in private prices [B] to farmers is Sucres 180, whereas the cost of tradable inputs in economic prices [F] is Sucres 100. As a result, the effect of policy on input costs [J] or [F - B] is a negative incentive of Sucres 80.

=====

		-----Costs-----		
	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
1. Private Prices	A	B = 180	C	D
2. Economic Prices	E	F = 100	G	H
3. Policy Effects	I	J = -80	K	L

=====

It should be noted that to measure the effects of policy on output, one uses [A - E] or the first row minus the second row, whereas to measure the effectiveness of policy on costs (input or factor), one uses [F - B] and [G - C] the second row minus the first row. This is because if the value of a row 1 entry is greater than the value of a row 2 entry, this has a positive effect on revenue, but a negative effect on costs. That is, if revenue in private prices is greater than revenue in economic prices, this has a positive incentive effect on a firm (his revenues are greater in private prices as a result of policy than they would be in economic prices in the absence of the policy).

On the other hand, if costs in private prices are greater than costs in economic prices, this has a negative incentive effect on a firm (its costs are greater in private prices as a result of policy than they would be in economic prices in the absence of the policy). In order to have all positive incentive effects (whether on revenues or costs) be reflected as positive values in the third row of the PAM, and all negative incentive effects (whether on revenues or costs) be reflected as negative values on the third row, we reverse the direction of the subtraction between rows 1 and 2 in the revenue column [A - E] from that used between rows 1 and 2 in the cost columns [F - B] and [G - C].

In the absence of market imperfections, **only** government policy can cause a divergence between private and economic prices. Unless the government enacts a protection policy, each importable output and input will be available at its c.i.f. import price, which will in turn become the domestic price. As a result, revenue in private prices [A] will equal revenue in economic prices [E] and the costs of tradable inputs in private prices [B] will be the same as those expressed in economic prices [F]. Consequently, any difference between [A] and [E] or between [B] and [F] is caused by some combination of trade restrictions, price control, tax/subsidy, or exchange rate policies.

If revenue in private prices [A] exceeds revenue in economic prices [E], either domestic consumers are forced to pay higher than world prices or the government treasury is directly subsidizing production, causing an output policy effect [I] equal to $[A - E]$. Similarly, if the cost of tradable inputs in private prices [B] is less than that in economic prices [F], tradable inputs are subsidized, resulting in an input policy effect [J] or $[F - B]$. For domestic factors, the policy effect [K] amounts to the difference between the cost of domestic factors in economic prices [G] and their cost in private prices [C].

Let us now recall the wheat example from page 20 where the government set the producer price for wheat at Sucres 2,500 per

bag, when the c.i.f. import price was only Sucres 2,000. The c.i.f. import price of the fertilizer used in producing the wheat was Sucres 1,000 per bag, but there was an import tariff of 30 percent. Also the government established a minimum wage for farm labor of Sucres 700, while the opportunity cost of such labor was only Sucres 600. The farmer uses one laborer, no capital, one sack of fertilizer and produces one bag of wheat. What are the incentive and disincentive effects of these government policies on the wheat farmer? [The reader is encouraged to calculate the values for the third row of the PAM before looking at the PAM below]

=====

PAM for Wheat Production Exercise

	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
1. Private Prices	A = 2500	B = 1300	C = 700	D=500
2. Economic Prices	E = 2000	F = 1000	G = 600	H=400
3. Policy Effects	I = 500	J = -300	K = -100	L=100

=====

Because the government has set the producer price of wheat higher than its economic price (i.e., the import parity price), the farmer receives a positive incentive of Sucres 500 [I], as

a result of output policies. But because there is an import tariff of 30 percent on imported fertilizer, the farmer pays Sucres 300 more than he would under free trade conditions, so that he is facing a negative incentive of Sucres 300 [J] from policies affecting inputs. Moreover, because the government has established a minimum wage that is higher than the opportunity cost of capital, the farmer's wage bill is Sucres 100 higher than it would be without a minimum wage policy, so that he is facing a negative incentive of Sucres 100 [K] from factor cost policies. The net effect of all policies is to provide this farmer with a positive incentive of Sucres 100 [L]. His private profitability, Sucres 500, is Sucres 100 more than it would be in the absence of these government policies.

5. Effects of Exchange Rate Policy

Since Ecuador has little or no market power with respect to most commodities, the economic prices of tradable outputs [E] and of tradable inputs [F] are established internationally. Neither commodity nor macroeconomic policies in Ecuador therefore, have significant effects on world prices and hence on economic valuations of tradable commodities.

Exchange rate policy can, however, cause the private prices of tradables [A and B] to be either higher or lower than

economic prices [E and F], in the same way that the use of a trade restrictions or import duties for a given output or input can cause a divergence.

For instance, let us assume that the government employs a fixed exchange rate policy, and/or chooses fiscal and monetary policies that permit a rate of inflation higher than the average rate experienced in its main trading partner countries. It then does not change the exchange rate (devalue its currency) sufficiently to offset the loss of international competitiveness caused by the differential inflation. As a result, in domestic currency, the private prices of tradables [A and B] will be lower than the economic price of tradables [E and F].

An overvalued exchange rate depresses the prices of tradables relative to those of nontradables and thus acts as a tax on all tradable activities (exporting or import-substituting). For example, let us assume the government of Ecuador decides to fix the exchange rate at Sucres 200 per US dollar. If it let the exchange rate be freely determined by market forces (so that the exchange rate would be equal to the rate at which the demand for foreign exchange would equal the supply of foreign exchange), let us assume that the rate would be Sucres 300 per dollar. The exchange rate is thus overvalued by 50 percent (Sucres 200 versus Sucres 300 per dollar).

In carrying out economic profitability analysis, it is very

important that one uses an estimate of the free market determined (equilibrium) exchange rate to convert foreign currency values into domestic currency values (in economic prices). If one uses instead a country's government determined exchange rate, the calculation of economic profitability as well as the measurement of policy effects will be incorrect.

The importance of the exchange rate can be illustrated by our same wheat example. Until now we assumed that the exchange rate of Sucres 200 per U.S.\$ 1 was not overvalued. We thus used it to convert tradable values (both in economic prices and in private prices) from U.S. dollars into sucres. This resulted in the following PAM values:

=====

PAM for Wheat Production Exercise

[All Values in Sucres; Exchange Rate = Sucres 200 per U.S.\$ 1.0]

	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
Private Prices	A = 2500	B = 1300	C = 700	D =500
Economic Prices	E = 2000	F = 1000	G = 600	H =400
Policy Effects	I = 500	J = -300	K = -100	L =100

=====

Now let us assume that the government becomes aware of the fact that the free market rate of the Sucres has fallen to

Sucres 300 per U.S. dollar, and decides to devalue the Sucre. How does this affect the values of the tradables (revenue and input costs) and nontradables (domestic factor costs) in the PAM?

The world price of wheat remains at U.S.\$ 10 per bag and the world price of fertilizer remains at U.S.\$ 5 per bag. But these values will now be converted to sucres at the new exchange rate of Sucres 300 per U.S. dollar. Thus, [E], wheat revenue in economic prices becomes Sucres 3,000 instead of Sucres 2,000. Similarly, [F], fertilizer cost in economic prices becomes Sucres 1,500 instead of Sucres 1,000. Since the government sets the producer price of wheat independently of world prices, it remains at Sucres 2,500 per sack [A = 2,500]. Fertilizer cost in private prices [B] increases to Sucres 1,950 (1,500 times 1.3) since the import duty of 30 percent is assessed at the new c.i.f. import price of Sucres 1,500. The price of labor (non-tradable) is unchanged by the exchange rate change. The government may later decide to adjust both the producer price of wheat and the minimum wage to reflect the devaluation, but in the short-run there is no change.

In private prices wheat production is now unprofitable. The cost of imported fertilizer has increased, while the producer price (and labor costs) remained unchanged. It no longer pays farmers to grow wheat--they in fact lose Sucres 150

[D] for every bag they produce (recall that at the old exchange rate of Sucres 200 per U.S. dollar, wheat production had a profit of Sucres 500 per bag).

=====

PAM for Wheat Production Exercise

[All Values in Sucres; Exchange Rate = Sucres 300 per U.S.\$ 1.0]

	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
Private Prices	A = 2500	B = 1950	C = 700	D= -150
Economic Prices	E = 3000	F = 1500	G = 600	H= 900
Policy Effects	I = -500	J = -450	K = -100	L=-1050

=====

In economic prices, by contrast, wheat production (a tradable) is much more profitable. Both the sucre value of the tradable output and the tradable input has increased by the amount of the devaluation. But since the input cost is only 50 percent of the value of the revenue, the net effect is positive. Economic profit increases from Sucres 400 before the devaluation [H on PAM of page 29] to Sucres 900 after the devaluation [H on PAM above].

Since wheat production is economically profitable (efficient) at the free market determined (equilibrium) exchange rate, its production should be encouraged by government policies. But

look at the effect of current government policies as shown on row 3 of the PAM! They are all negative. Wheat producers receive less than the c.i.f. import price for wheat, and they pay more than the c.i.f. import price for fertilizer, and they also pay more than the opportunity cost for labor they hire.

If you were the new Minister of Finance of Ecuador, what policy changes would you introduce? Could you induce farmers to grow wheat without requiring the treasury to do with less import duties? Or, would you try not to increase the producer price of wheat because you want urban consumers to continue to have cheap bread? [Remember, if you make no policy changes there will be no "cheap bread" because Ecuadorean farmers will refuse to continue to grow wheat and make a loss of Sucres 150 per bag. Your only option will be to import it at Sucres 3000 per bag--and either consumers or the government budget will have to pay for the increased cost of wheat].

C. Ratios

The results illustrated in the PAM are sufficient to analyze a single product or to compare two or more technologies that produce the same good. But no precise meaning can be attached to a comparison between a producer that obtains economic profits of Sucres 50,000 per hectare of hard corn and one that generates

economic profits of Sucres 1,000,000 annually from production of towels. The formation of certain ratios facilitates such comparisons.

Three especially useful ratios are listed in the following tabulation (where symbols are drawn from the PAM).

1. Nominal Protection Coefficient = NPC = A / E
2. Effective Protection Coefficient = EPC = $[A-B] / [G-F]$
3. Domestic Resource Cost Ratio = DRC = $G / [E-F]$

1. The Nominal Protection Coefficient (NPC)

The Nominal Protection Coefficient (NPC) is the ratio of the enterprise's revenue in private (actual market) prices to its revenue in economic (efficiency) prices.

The NPC reflects the degree of protection received by a firm on its output. For example, the Sucres 100 price of a good produced domestically is compared to the economic price (the c.i.f. price for an importable or the f.o.b. price of an exportable good) for a comparable good. If the economic price is Sucres 80, the resulting NPC is 1.25 (100/80), which means that revenue accruing to the firm from sales of this good are 25 percent greater than if it were freely traded.

A NPC greater than one indicates that the producer is receiving positive incentives--or protection--on output, whereas a

NPC less than one indicates the producer is faced with negative incentives.

2. The Effective Protection Coefficient (EPC)

The second ratio, the **Effective Protection Coefficient (EPC)** takes into account not only the effects of policy on revenue (output), but also the effects of policy on inputs used in production. The **EPC** is represented by the ratio of value added (revenue from sales of tradable outputs minus the costs of tradable inputs) in private prices to value added in economic prices.

Divergences between private and economic costs of tradable inputs occur when government policies such as taxes, customs duties, price control or a requirement to purchase a good locally, affect the price of an input to the producer.

An **EPC** greater than one indicates that the firm or farmer is receiving a net positive incentive on the combination of policies influencing its sales revenue and tradable input costs. Likewise, a value less than one indicates that the producer is receiving a net disincentive. For example, if the domestic price of a good is Sucres 100, and the (market) cost of the inputs is Sucres 60, the value added in domestic prices is Sucres 40 (100 - 60). If the same good is valued at economic prices, and the price is Sucres 60 and the cost of inputs is

Sucres 30, the value added in economic terms is 30 (60 - 30). The EPC is $40/30 = 1.33$ or 33 percent.

A product can have an NPC greater than one and an EPC less than one if the disincentives on inputs of production are greater than the incentives or protection on sales. In the absence of government policy (and market imperfections) private prices would be equal to economic prices and both of the above ratios would equal one. However, even the EPC is a limited indicator of incentives because it does not account for the effects of policies on costs of factors (labor, capital and land).

3. The Domestic Resource Cost Ratio (DRC)

The Domestic Resource Cost Ratio (DRC) is the ratio of domestic factor costs in economic prices [G] to value added (revenue minus tradable input costs, E-F) in economic prices.

Since the DRC ratio includes domestic factor costs, it measures not only policy effects on tradable inputs and outputs, but also the opportunity costs of using domestic factors in production. It can therefore serve as a measure of comparative advantage. As shown in the PAM presented above, the costs of domestic factors are essential in determining economic profitability.

As a ratio, the DRC measurement allows economic profitabil-

ity [H in the matrix] to be compared across commodities. A DRC less than one indicates that the particular activity is economically profitable; in the absence of government policy this activity would produce more than enough value added to remunerate labor and reimburse capital owners. Alternatively, it indicates that the country has a comparative advantage in producing a good--or is an efficient producer of the commodity--because the domestic factor costs [G] incurred in its production are less than the direct foreign exchange earnings or savings [E-F].

Algebraically the DRC is defined as $[G / (E - F)]$, and [H] is defined as $[E - F - G]$, then by definition, if and only if [H] is positive, the DRC will be less than 1. One can state the condition of economic efficiency either by saying that the activity has a DRC smaller than 1, or by saying that it has positive economic profits $[H > 0]$.

Conversely, a DRC greater than one indicates that the particular activity is not economically profitable; in the absence of government policy this activity would not produce enough value added $[E - F]$ to remunerate labor and reimburse capital owners [G]. The country clearly does not have a comparative advantage in producing this good or alternatively, it is not an economically efficient activity for the country.

The PAM for the wheat producer (shown on page 32) is reproduced below.

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PAM for Wheat Production Exercise

	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
1. Private Prices	A = 2500	B = 1950	C = 700	D= -150
2. Economic Prices	E = 3000	F = 1500	G = 600	H= 900
3. Policy Effects	I = -500	J = -450	K = -100	L=-1050

=====

It is recommended that the reader calculate the NPC, EPC and DRC for this activity. Is it economically efficient (economically profitable)? Is wheat production an activity in which Ecuador has a comparative advantage? Does wheat production make a positive contribution to foreign exchange earnings or savings? Is it privately profitable? Are wheat producers receiving positive or negative incentives from government policies affecting (1) output, (2) inputs, and (3) factor costs? Is the net effect of all policies to provide a positive incentive or negative incentive to wheat production?

[NPC = .83

EPC = .37

DRC = .40]

D. Review Exercise

The following exercise is intended to allow readers the opportunity to test their understanding of the methodology before proceeding further. The answers to the exercise can be found on pages 42 through 48.

Thrifty Sewing Machines assembles and sells sewing machines in Ecuador from imported components. After Thrifty began production, the government barred imports of sewing machines in order to protect the national sewing machine company from competition from imports. It also guaranteed Thrifty that it would not allow anyone else to assemble sewing machines in Ecuador, since as Thrifty pointed out, the Ecuadorian market is not big enough for two firms.

Thrifty Sewing Machines buys components for U.S.\$ 50 for each machine. It sells the assembled sewing machines for Suces 27,000 each. Labor costs per machine are Suces 2,000 and its capital costs are Suces 3,000 per machine. The sewing machine company received a government loan to cover all its capital costs at an interest rate of 20 percent, while the market determined interest rate is 40 percent. The c.i.f. import price of sewing machines is U.S.\$ 60 (although such imports are currently prohibited). The free market determined exchange rate is Suces 300 per U.S. dollar.

1. Questions

- a. Fill out each of the 12 elements of Thrifty's PAM.
- b. Calculate the NPC, EPC and DRC of Thrifty Sewing.
Use the PAM values and the values of the ratios that you have calculated to answer the following questions:
- c. Is Thrifty Sewing Machines economically efficient? Is it privately profitable?
- d. Does Ecuador have a comparative advantage in the production of sewing machines?
- e. Does Thrifty saves Ecuador foreign exchange?

=====

PAM for Thrifty Sewing Machines

		-----Costs-----		
	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
Private Prices	A =	B =	C =	D =
Economic Prices	E =	F =	G =	H =
Policy Effects	I =	J =	K =	L =

=====

- f. Fill out a separate PAM for Native Handicrafts, using the following information on its activities. The manager of Native Handicrafts, has just returned from the U.S., where he has been offered U.S.\$ 4 a garment, delivered in New York. Transport cost from Otavalo to New York is U.S.\$ 3

per garment. Fabric costs are Sucres 425 per garment, labor costs are Sucres 200 per garment, and sewing machine costs are Sucres 300 per garment (Native Handicrafts has just purchased sewing machines from Thrifty Sewing). Note that Native Handicrafts is a lot more labor-intensive than Thrifty, and also employs people in low income regions where the government wishes to increase incomes to further its more equal distribution objective.

=====

PAM for Native Handicrafts

	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
Private Prices	A =	B =	C =	D =
Economic Prices	E =	F =	G =	H =
Policy Effects	I =	J =	K =	L =

=====

- g. Fill out the PAM values and calculate the NPC, EPC and DRC of Native Handicrafts.
- h. Use the PAM values and the values of the ratios that you have calculated to answer the following question: how does the existence of Thrifty Sewing affect the ability of Native Handicrafts to export garments from handwoven fabric?
- i. What policy changes would you introduce? Please be sure to specify your policy objectives.

2. Answer Sheet for Review Exercise

a. Thrifty Sewing Machines Company's PAM.

=====

PAM for Thrifty Sewing Machines

		-----Costs-----		
	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
Private Prices	A =27,000	B =15,000	C =2,000 (W) C =3,000 (M)	D=7,000
Economic Prices	E =18,000	F =15,000	G =2,000 (W) G =6,000 (M)	H=-5,000
Policy Effects	I = 9,000	J = 0	K =3,000	L=12,000

=====

Note: (W) represents labor costs (wages)
(M) represents capital costs of the sewing machines

b. Thrifty Sewing Machine Company's ratios are as follows:

$$\begin{aligned}
 \text{NPC} &= A / E \\
 &= 27,000 / 18,000 \\
 &= 1.50 \text{ or } 50 \text{ percent}^* \\
 \text{EPC} &= A - B / E - F \\
 &= 27,000 - 15,000 / 18,000 - 15,000 \\
 &= 12,000 / 3,000 \\
 &= 4 \text{ or } 300 \text{ percent}^*
 \end{aligned}$$

* NPC's and EPC's can alternatively be presented in percentage terms. By convention, they are referred as NRPs (nominal rates of protection) and ERPs (effective rates of protection. $\text{NRP} = [\text{NPC} - 1] * 100$; $\text{ERP} = [\text{EPC} - 1] * 100$

$$\begin{aligned} \text{DRC} &= G / E - F \\ &= 8,000 / 18,000 - 15,000 \\ &= 8,000 / 3,000 \\ &= 2.67 \end{aligned}$$

- c. Thrifty is not economically efficient because its DRC is greater than 1, even when all foreign exchange values are converted to sucres at the free market determined exchange rate of Sucres 300 per U.S. dollar. It is however profitable [D = 7,000].
- d. Ecuador does not have a comparative advantage in producing sewing machines because the DRC is greater than 1.
- e. Thrifty does not save Ecuador foreign exchange because the DRC is greater than 1. This means that the value of the domestic resources used in producing sewing machines [G] is greater than the value of the net foreign exchange earnings [E - F] from the production of sewing machines. Ecuador should reallocate these domestic resources [G] to another activity where the net foreign exchange earning is greater than the value of the domestic resources used (this implies an activity with a DRC smaller than 1). This reallocation would result in an increase in foreign exchange earnings or savings.

f. Native Handicrafts' PAM.

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PAM for Native Handicrafts

-----Costs-----

	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
Private Prices	A = 900	B = 425 (fabric) B = 300 (machines)	C = 200	D= -25
Economic Prices	E = 900	F = 425 (fabric) F = 200 (machines)	G = 200	H= 75
Policy Effects	I = 0	J = -100	K = 0	L= -100

=====

g. Native Handicrafts ratios are as follows:

$$\begin{aligned}
 \text{NPC} &= A / E \\
 &= 900 / 900 \\
 &= 1.00
 \end{aligned}$$

$$\begin{aligned}
 \text{EPC} &= A - B / E - F \\
 &= 900 - 725 / 900 - 625 \\
 &= 175 / 275 \\
 &= .63
 \end{aligned}$$

$$\begin{aligned} \text{DRC} &= G / E - F \\ &= 200 / 900 - 625 \\ &= 200 / 275 \\ &= .73 \end{aligned}$$

- h. Thrifty's existence makes it more difficult for the handicrafts company to export garments. This is because sewing machines are an input cost for Native Handicrafts--and because of Thrifty Sewing Machines, the handicrafts company must pay Sucre 27,000 for a sewing machine instead of the c.i.f. import price of Sucre 18,000, a 50 percent cost increase. Equivalently, its sewing machine costs per garment are Sucre 300 versus Sucre 200.

In order to cover the 50 percent higher cost of the sewing machines, the handicrafts company must try to export its garments for a higher price. But in trying to export garments, Native Handicrafts must compete with garments produced all over the world. It may find it difficult to compete with garments from a country where the government does not protect sewing machine assembly, and thus garment makers elsewhere in the world can buy imported sewing machines at the equivalent of the c.i.f. import price of Sucre 18,000 rather than the Sucre 30,000 that Native Handicrafts is paying for its sewing machines.

- i. The objectives of my government are economic growth (efficiency), higher employment and more regionally balanced growth.

I am unhappy with existing policies because they are providing a positive incentive [L] of Sucre 12,000 to Thrifty Sewing Machines, an activity which is inefficient (economic unprofitable) with a DRC of 2.67. Equally inappropriate, Native Handicrafts which is economically efficient with a DRC of .73 is receiving a negative incentive [L] of Sucre -100.

Since Thrifty Sewing Machines is less labor intensive than Native Handicrafts, and is in Quito, not in Otavalo, there are no offsetting benefits to compensate for Thrifty's economic inefficiency.

I would thus modify policy as follows. Although Thrifty Sewing Machines is economically inefficient, it would be politically unwise to force it into bankruptcy overnight. I will therefore make its operation less profitable (so it will not be given an incentive to expand or even replace its depreciating fixed assets) but not entirely unprofitable. I will do this by allowing imports of sewing machines, but will make them subject to a 20 percent import duty.

Imported sewing machines will thus be available to Native

Handicrafts for Sucre 21,600 (18,000 times 1.2). This will reduce Thrifty's profits to Sucre 1,600 per machine. This is because Thrifty must now lower its domestic selling price from Sucre 27,000 to Sucre 21,600 in order to compete with imports.

I will also announce that my government plans to continuously and gradually reduce import duties. This will give Thrifty a warning that it better reduce its costs somehow or get out of the sewing machine assembly business.

Native Handicrafts has had its sewing machine costs reduced by 80 percent (from Sucre 27,000 to 21,600), or from Sucre 300 to Sucre 240 per garment. Its private profits are now a positive Sucre 35 [900 - 425 - 240 - 200], but this is still quite low, and Native Handicrafts is still receiving a net policy disincentive of Sucre 40.

Since the handicrafts company is economically efficient, I wish it to receive a positive incentive from policy.

Unfortunately there is no way that this can be done without a cost to the government budget, given the constraint that I keep the import duty of 20 percent on sewing machines to continue to protect Thrifty Sewing Machines.

Probably the least disturbing way to provide Handicrafts with an incentive would be to give it an export subsidy of

10 percent. Native Handicrafts' PAM would now look as follows:

=====

PAM for Native Handicrafts

-----Costs-----

	<u>Revenue</u>	<u>Tradable inputs</u>	<u>Domestic factors</u>	<u>Profits</u>
Private Prices	A = 990	B = 425 (fabric) B = 240 (sewing)	C = 200	D= 125
Economic Prices	E = 900	F = 425 (fabric) F = 200 (sewing)	G = 200	H= 75
Policy Effects	I = 90	J = -40	K = 0	L= 50

=====

Chapter 3

Detailed Analysis of One Activity

This chapter will take the reader through each step required in carrying out a private and economic profitability analysis for a particular activity. As we will show, this is rather more complicated than in the case of the simple numerical examples of Chapter 2. To assist in this transition between the abstract and the particular, this chapter presents a detailed case study of a small flower exporting firm in Ecuador.

Section I of this chapter illustrates techniques for obtaining the required data for the analysis. Section II explains the use of a microcomputer to carry out the actual analysis of the data. Section III provides suggested methods for explaining the results of the analysis to policymakers.

The next chapter provides profitability and efficiency indicators for several different activities (enterprises) in Ecuador, as well as, for comparison, the results of a comprehensive study carried out in Zimbabwe. It provides additional suggestions and techniques for effectively presenting the results of profitability analysis to policymakers.

A. Obtaining Data From the Firm

Step 1: Select the Activity to be Analyzed

The first step is to select the activity to be analyzed: in most cases this will be fairly straightforward. A particular firm or sector will be of interest to the policymaker and it will have been decided that private and economic profitability analysis should be carried out for one firm or a sample of firms. In our specific case, there was an interest in USAID in determining the actual and potential contribution of non-traditional exports to increased foreign exchange earnings. Which non-traditional export activities have the greatest potential? Which ones are most efficient? How are they presently being affected by government policy?

A number of flower exporting firms had received loans under an AID Project. We selected one which seemed to be fairly representative as a potential candidate for private and economic profitability analysis.

Step 2. Design a Questionnaire

Once the firm or firms to be analyzed have been selected, a questionnaire must be designed, which once filled out by the firm, will provide the analyst with all the data required for private and economic profitability analysis.

The key elements in questionnaire design are **brevity and clarity**. The world is full of 20 page and even 50 page questionnaires which, if filled out would provide the analyst with all the data he might require, but which in fact were never filled out. Why? Because they were not designed with brevity as an essential requirement. In the private sector, time is money, and patience is a virtue which often is in short supply. After being handed a questionnaire, the first thing the manager of the firm does is glance at it and note how many pages long it is. If it is more than 10, he is very likely to change his mind if he has tentatively agreed to cooperate. Two thoughts are running through his mind: (a) my staff does not have time to fill out all these pages and (b) I don't want all that much information being released on my operations.

So in designing a questionnaire, **set a limit of 5 or so pages** and then try to state the required questions in as clear and as brief form as possible. A copy of the questionnaire which we designed for use in our non-traditional export study is provided at the end of this chapter. Note that it is 5 pages long. It should also be noted that although this questionnaire is in English, the questionnaire was translated into Spanish and the Spanish version actually used in the survey.

The first page begins with a brief explanation of the purpose of the questionnaire. This is for the benefit of those persons who may be asked by the manager to fill out the questionnaire and who were not at the initial meeting where the purpose of the exercise was explained.

The rest of the first page requests information concerning revenues--revenues in private prices [A], and revenues in economic prices [E], of the Policy Analysis Matrix (PAM). Some firms may make dozens of individual products and thus we ask that detailed information only be provided for the firm's three most important products.

We specify that the sales value be given **ex-factory**, excluding taxes in the case of local sales, and in the case of exports, **f.o.b. port**, less transportation costs from the factory to the port. We wish to compare the net revenue from exports and from local sales of an identical product.

In the case of exportables, whether they are sold locally or exported, the **f.o.b. export price** is the economic price; the local sales price will be the private price. It is extremely important that the firm provide price information on identical products exported and sold locally. Often a firm will manufacture a product of two different qualities--one for export and one for local sales. If this is the case, one must request that the firm give us an adjustment to the local sales price so

that the adjusted price reflects the price of an item of comparable quality to the export product.

If this questionnaire were to be used for firms which are not exporters, but instead produce import substitutes, the first page would be modified as follows. Instead of asking for the f.o.b. export value of the products exported, the firm would be asked to provide the c.i.f import price of products comparable to those the firm produces. This data is rarely immediately available from the firm, but most firms can obtain such data. An alternative source of such data is local firms who use this firm's output as an input and know the price they would have to pay for a comparable product if they were free to import it.

On page 1 we also ask for information on beginning of the year and end of the year inventory values for semi-finished and finished products. This is so that revenues can be adjusted to reflect changes in inventory. If this adjustment is not made, the value of sales for the year will be overestimated or underestimated, depending on whether inventories have increased or decreased during the year.

In countries such as Ecuador where the exchange rate fluctuates, it is also necessary to ask the firm to specify the exchange rate used to convert foreign exchange values into local currency values.

Lastly on page 1 we ask for non-sales revenues. These are

non-interest revenues for which the relevant costs are included in the firm's cost data provided. For example, the firm may have a photocopy machine and sell copies. If the photocopy machine is listed among the firm's assets (page 5 of the questionnaire), we need to include the revenue from this asset on page 1. Otherwise the firm's revenues from its capital costs will be understated.

The second page of the questionnaire asks for information on the firm's material input costs: tradable input costs in private prices [B], and tradable input costs in economic prices [F] of the PAM. In order to obtain costs in economic prices, we must ask the firm to indicate the amount of import duties and taxes he pays on inputs. There are three separate categories of tradable inputs:

- (1) those the firm imports directly;
- (2) those the firm buys locally (but others import or which others assemble or mix locally from imported components); and
- (3) those the firm buys locally (and which are produced locally)

We ask the firm to indicate which of these three categories are appropriate for each major input cost. For category (1) inputs, those that the firm imports itself, it will have information on the amount of import taxes it pays. For category (2)

imports it will not have this information. In the interview, the analyst can ask the firm for the name of the importer and can then obtain the data from the importer, or, alternatively, the analyst can obtain this data from the import tariff book.

For category (3) inputs, those purchased and produced locally, firms often do not pay any taxes--but this should be confirmed in the interview.

In Ecuador there is a requirement that a firm deposit for 3 months with the Central Bank either 50 or 80 percent of the value of its imports. It receives no interest on these funds. This foregone interest cost must be included as a cost of imports in private prices, just as are the import taxes paid. The firm should be asked which imports are subject to the 50 percent deposit, and which subject to the 80 percent deposit. (Alternatively, if the firm provides enough detail on the import, this determination can be made by looking up the item in the tariff book "Arancel de Aduanas Integrado").

Page 3 of the questionnaire asks for the value of energy costs and for the cost of miscellaneous services. For all of these costs, the firm is asked to separate out the amount of taxes paid. Since the miscellaneous service costs of each firm varies, it is usually a good idea to offer the firm a choice. It can either add to section IV of the questionnaire the particular cost items of the firm, or it can leave this section blank

on the questionnaire and instead provide a copy of the actual accounts of the firm where these costs are all enumerated. This latter method is usually preferred. It is also less prone to errors of omission. The analyst should be certain that he omits all amortization, interest and depreciation costs, since, as we shall see, these are treated differently in profitability analysis than they are by the firm's accountant.

The fourth page of the questionnaire requests information on labor costs--one of the major components of domestic factor costs, items [C] private prices, and [G] economic prices of the PAM. It asks for a separate breakdown of numbers employed and of wage and benefit costs by unskilled, skilled and managerial categories. It also asks for a separate breakdown of employee taxes paid by the firm.

Most firms do not find it difficult to breakdown their employee costs into these three skill categories. The reason this breakdown is requested is that often the comparison between the actual wages paid and the opportunity cost of the labor varies significantly between these three categories. One can then separately adjust wage costs for each of these three categories of workers in order to obtain estimates of wage costs in economic prices. For example, in many countries there is a high percentage of unemployed unskilled workers, while at the same time there is a government minimum wage for unskilled

workers. This results in the actual wages paid to unskilled workers being significantly above their opportunity costs. On the other hand, there may be no excess supply of skilled or managerial employees and, as a result, their wage may be equal to their opportunity cost.

In order to obtain the firm's estimate of the opportunity costs of its labor, we ask the firm how many employees it would have and how much its labor costs would be if there were no government wage legislation. This is of course difficult for firms to imagine, but most are willing to venture a guess. If the firm really feels that it has to pay its unskilled workers twice what it could get them for if it were not constrained by minimum wage legislation, it is likely to respond that in the absence of government wage policy, it would maybe hire more workers and pay each of them fifty percent less.

Another source of information on the opportunity cost of labor is employment or income surveys done by government or private sector institutions. Such surveys may provide data on wages paid in the "informal sector" which is not subject to government labor policies. One can then compare wages paid to various categories of workers in the informal sector (which represent opportunity costs) and wages paid by the firm being interviewed, which usually is in the formal sector.

Page 5 of the questionnaire asks for data on the other

two components of factor costs, land and capital. The firm is asked to provide estimates of the current market value of each major category of fixed asset. This is data which often is not readily available. Firms' value fixed assets at book value or depreciated value in their accounts (i.e., original cost less accumulated depreciation), not at current market value. For the purposes of profitability analysis however, it is current market value which we require. This is because we must annualize the firm's investment costs so that we know how much to charge as a cost in the one particular year for which we are carrying out the profitability analysis. A firm does this in its accounts by setting aside an amount for depreciation--but this may not reflect the actual "wear" cost, since depreciation amounts are often influenced by income tax considerations.

For this reason, there is a practical convention used in profitability analysis for estimating the annual cost of fixed assets. This convention is to first estimate the current market value of fixed assets. One then applies the firm's actual interest rate cost to this amount in order to obtain an estimate of its capital costs in market prices. For the capital cost in economic prices, one applies the opportunity cost interest rate or the best rate which the firm could earn if instead of having its capital tied up in the firm's fixed assets, it instead had this sum available to earn interest in a financial institution in the country.

A firm also has funds invested in its working capital (current assets minus current liabilities, excluding inventories). The annual cost of this capital is also estimated by applying either the firm's actual short-term interest rate or the opportunity cost interest rate to this amount.

Thus the two types of questions asked on page 5 of the questionnaire are (a) what is the current market value of fixed assets, and the working capital requirements of the firm and (b) what interest rates does the firm pay or earn in the short-run and in the long-run.

Lastly, on page 5 the firm is asked to estimate the percentage of capacity utilization that they were operating at during the past year. This information is required in order to do a capacity adjustment DRC measurement. If a firm was operating at only 75 percent of full capacity, it is really only using 75 percent of its fixed assets; therefore, we adjust the capital costs downward by 75 percent. This adjusted DRC is called DRC (CU).

After the firm fills out this five page questionnaire, the analyst will have enough information to fill out the 12 elements of the PAM. It is sometimes difficult to convince a firm to fill out the questionnaire however. The most important objective of the first interview with the firm management is to obtain their agreement to fill out the questionnaire.

**Step 3. First Interview with Manager: Explain Objectives
and Assure Confidentiality**

After designing the questionnaire, the next step is to arrange an interview with the head of the firm. It is essential that this first contact be made on a personal basis--usually a telephone call to the manager of the firm requesting a meeting at his office.

It is almost never effective to make the initial contact, requesting a firm's cooperation, by mail. This gives the manager time to think of specific reasons why he cannot cooperate, so that when he is contacted by phone, he has already prepared his refusal.

On the telephone requesting the appointment, as little information as necessary should be given as to the reason for the interview. It is best to explain the objectives of profitability analysis in person--not over the phone.

At the initial interview with the firm management, the analyst should briefly explain his interest in carrying out a private and economic profitability analysis for this firm. The objectives of such analysis should be briefly explained. The self-interest of the firm in having such analysis done should then be pointed out specifically. The manner in which this is done depends on the specific type of study being done. In our

case, we pointed out to the owner of the firm (who was also the manager) that we were interested in obtaining information on non-traditional exporters in order to assess how great a contribution they were making to foreign exchange earnings. We also indicated that we were interested in examining how they were currently being affected by government policies and that we were looking for ways in which AID (or the government) could be of further assistance to non-traditional exporters like this firm.

The second most important task of the initial interview with the firm management is to assure the firm that all information obtained from it will be treated with confidentiality. This is because the information required for profitability analysis (data on the firm's revenues and costs) is data which could be extremely harmful to the firm if it were to be made available to its competitors, or to the income tax department of the country. Thus it should be understood that the request for this data is going to be considered with some degree of alarm and reluctance. This must be anticipated and an effort made to alleviate the fear that if the data is given, it could be harmful to the firm.

The analyst can then proceed with the interview. It is useful to begin by asking very general questions about the firm. How long has it been in production? Does it produce both for

the local market and for export? What types of products does it make? These general questions serve two functions: one, it relaxes the manager (these are the types of questions he is comfortable with); secondly, it shows the manager that you are genuinely interested in his firm and its operations.

The next phase of the interview begins with the analyst showing the questionnaire to the manager. It should immediately be pointed out that most of the information required is available in the firm's accounts, since it pertains primarily to the firm's revenues and costs for the most recent year for which such data is available.

Next, the analyst should determine whether the manager will be filling out the form or whether someone else in the firm will be doing this. If someone else, the interviewer should suggest that that person be called into the meeting, or that the interviewer could perhaps make an appointment to talk to that person after the end of this interview.

If, as was the case with our flower exporter, the manager himself will be filling out the questionnaire, one can then proceed to briefly go over the questionnaire. The main purpose of this is to give the manager a chance to ask any questions, and for the interviewer to point out common pitfalls.

Page 1: Mention that we are interested in price comparisons between local sales and export sales of identical products. For domestic sales the price should be ex-factory, excluding taxes, and for export sales, the net f.o.b. export price. Transportation costs from the factory to the port should be deducted from the f.o.b. port price.

If the firm does not export at present, ask for estimates of what it feels its f.o.b. export price would be. If it does not know, ask if it can find out, perhaps by sending a telex to persons who have expressed an interest in the past.

In the case of our flower exporting firm, the firm currently exports 90 percent of its flowers, and sells the remaining 10 percent locally. The same type of flower is sold locally and is exported.

Page 2: Indicate the importance of the firm providing information on all taxes and duties it pays on inputs. Explain that this is because in economic prices taxes are excluded from costs. Thus when we do an economic analysis, we will subtract all taxes paid from its costs. Firms always think this is a good idea!

If the firm does not import all imported inputs directly, but buys some from local importers, obtain from the firm as much detailed information as possible on these inputs. What is the name of the importer he buys from? With this information we

have two options available in order to obtain information on import duties on such inputs: we can contact the importer, or we can look up the items in the tariff book ourselves and determine the duty rates.

Page 3: The major pitfall with this page is that firms sometimes omit some of their miscellaneous costs. We cannot anticipate all the cost categories the firm uses in its accounts. There is thus a tendency for firms to omit these costs since they are not specifically asked for on the questionnaire. It is important to stress that all the firm's costs must be included somewhere on the questionnaire. The only costs we do not need are amortization and interest expenses. All other costs should be included. It should be pointed out that the easiest way to do this is for the firm to give the interviewer a copy of its computer printout of its revenues and costs for the year. Then the firm will not have to bother to list all miscellaneous costs separately on the questionnaire. If the firm is willing to do this, this is an excellent check on all the information the firm provides on the questionnaire. The interviewer should always request a copy of the accounts.

The flower exporter firm furnished us with a detailed computer printout of its accounts. We in fact used these accounts, rather than the filled out questionnaire, to input the firm's data on the computer for our analysis.

Page 4: Labor costs. These are usually straightforward. The only difficulty is to obtain from the firm information on what it considers to be the opportunity costs of each type of labor. To obtain this information, simply explain that we are trying to separate out the effects of government policies on his costs. If there were no labor legislation, would he pay his labor more or less? Would he hire more or fewer workers? Some individuals respond well to hypothetical questions, others do not. If the person you are interviewing does not, do not press him for information.

Page 5: Capital costs. This is usually the most difficult question for the firm to complete. This is because, as mentioned above, many firms do not have information on the current market value of their fixed assets. They have information on the book value of these assets only. Ask the manager if he knows the current market value of his fixed assets. If he is unsure what you mean by current market value, give him the following hypothetical situation. His factory burns down tonight. But there is one exactly like it across the street. How much would he be willing to pay for this factory across the street? That amount is what we mean by the current market value.

Ask the manager if he has had the firm's fixed assets revalued. This is another source of data on current market

value. Lastly, ask him how the firm's assets are valued on its fire insurance policy? In some cases, current market value is used as the basis of the valuation for insurance purposes (but of course in many cases it is not).

The questions on working capital, interest rates and capacity utilization are usually straightforward.

After going through the questionnaire briefly, ask the manager if he has any questions. Then ask him one or two more brief questions, designed to confirm your interest in his firm and in any problems the manager may have. The interviewer should always be willing to listen patiently to any complaints or problems which the manager brings up during the interview.

End the interview by asking the manager what he considers to be his biggest problem in operating his firm. It is surprising the answers this sometimes elicits. It is very useful in putting the interviewer in the frame of mind of the manager. It is also a good indication of what type of assistance might be most needed by the firm. For example, if the manager says his biggest problem is finding foreign buyers for his product, one might arrange for him to talk to commercial attaches of various embassies, or to put him in touch with trade fairs or other channels available for advertising his product or being put into contact with potential buyers.

In the case of our flower firm, the manager stated that his biggest problem was the quality of the imported bulbs he uses. He knows that if he could grow his own bulbs he could improve the quality of his flowers, and increase his export revenues. But to do this he needs a green house. He also needs a cold storage room to keep his flowers refrigerated so that he can export them directly himself, rather than having to rely on a local firm that presently exports for him. Our flower exporter would thus be interested in being put into contact with sources of equity or loan capital so that he can make these additional investments.

At the end of the interview, the manager normally asks if the interviewer is interested in a tour of the factory. If at all possible, take the manager up on the offer. It is very useful to take a tour of the premises in order to understand the strengths and weaknesses of the firm. It also gives another opportunity to show an interest in the firm, as well as provides a chance to ask questions that will result in more accurate information being used in the profitability analysis.

Lastly, thank the manager for his time and arrange to meet again to collect the completed questionnaire and to go over it. A week is usually sufficient time for the questionnaire to be completed. Tentatively suggest a second meeting in one week.

**Step 4: Second (Third, Fourth...) Interview with Manager:
Collect Questionnaire and Go Over It With Manager
And Any Others Who Filled It Out**

A day or two before the second interview, telephone the manager and confirm that the questionnaire will be completed. In most cases he will say that it will not be completed because of various problems the firm has had--normally these have nothing to do with the questionnaire, but with general operations. The interviewer should be prepared for this delay, and accept it graciously. However, the interviewer should then stress the importance of obtaining the data as soon as possible, and arrange for a new second appointment, perhaps 2 or 3 days later than originally scheduled. Mention that everyone who has worked on the questionnaire should also be at the meeting to answer any questions that might arise.

At the second meeting, go over the questionnaire very carefully with everyone who has filled it out. There invariably will be errors and omissions. Do not express any impatience or frustration. Remember, even though you may have gone over this questionnaire 50 times, this is the first time for the firm. In most cases, they have tried their best. Be patient, express appreciation for the sections they have filled out correctly, and be persistent in asking again for the information

which is still missing. Point out that if you don't get all the information you require, you cannot carry out the profitability analysis. Thus you have to insist that they provide all the information--90 percent of it will do you no good.

The most important elements of the second interview are patience, tact and persistence. Do not take no for an answer, but be patient and tactful enough that you are unlikely to be given no! Be prepared to have to arrange for a third interview, and in many cases a fourth or even fifth, before you obtain all the information you require. Keep smiling! Collecting the data for private and economic profitability analysis is not a task for the chicken-hearted. Having a sense of humor and infinite patience are definite pluses. Remember this is the most difficult task. The rest is all gravy.

B. Inputting the Data on a Microcomputer

After having persisted through a number of interviews in order to get all the required data, this phase is like a deserved vacation. There is just you and the microcomputer.

The calculations required for private and economic profitability analysis are the same no matter what the activity. For this reason it is possible to prepare a spreadsheet file which provides spaces for inputting all the data and which contains

all the required formulas. This file can then be used for inputting the data for all the firms included in the study.

For our study we selected the spreadsheet software Lotus 123 which runs on all IBM compatible microcomputers. We spent one day preparing a file entitled DRCFORMe which we then used for inputting the data for each firm we analysed.

It is necessary for at least one member of a study team to be familiar with spreadsheet software. This person can then be in charge of setting up the file to be used for inputting the data. The remaining members of the team can then simply input the data. They do not have to be expert at using the software. However, it is suggested that they become somewhat familiar with the software so that they can conduct sensitivity analysis.

A printout is included at the end of this chapter of our DRCFORMe Lotus 123 file. Although the printout is 3 pages long, the form is all on one file, in the area of the spreadsheet from columns A through G and lines 1 through 160. There are basically 4 columns. The first column describes the line item. For example, line 14 is revenue from sales on the local market of product 1. The second column provides a space for entering this value in private prices. In the case of revenue, this is the ex-factory price multiplied by the quantity sold. The third column is entitled conversion factor. In this column one enters the ratio of the economic

price to the private price, which is known in economic parlance as the conversion factor. For example, if product 1 is an exportable, and the domestic sales price is 100 and the f.o.b. export price, ex-factory is only 80, the conversion factor for local sales of product 1 is $80/100$ or .8.

In order to obtain the value for local sales of product 1 in economic prices, one multiplies the value in private prices (column 2) by the conversion factor, .8 in column 3. The resulting value in economic prices is entered in column 4. One never types a value into column 4 because all the values in this column are obtained by a formula: column 3 times column 2. So all the analyst does is input data for column 2, value in private prices, and the conversion factor in column 3. The computer calculates the value in economic prices in column 4 using the formula: column 2 times column 3.

For some cost items, such as electricity, gasoline, labor, and transport costs, the conversion factors used to convert values in private prices to values in economic prices will be the same for all firms in a country. In this case, the analyst enters these on the *DRCFORMe* in the appropriate spaces of column 3. These then are automatically used for each form. For example, electricity costs in private prices are estimated to be only one-half of their value in economic prices, which reflects long-run marginal cost of providing electricity. We

thus entered the value 2.0 in the conversion factor column for electricity. Thus for all firms, electricity costs are multiplied by 2 in order to convert these costs from private prices to economic prices.

We have indicated with an X the lines on column 2 where the analyst inputs data from the questionnaire. As can be seen, there are very few numbers that the analyst must enter (37). Most of the cells on the DRCFORMe contain formulas so that the computer automatically calculates the sub-totals and totals of various revenue and cost categories, and calculates the various elements of the PAM and the PAM ratios. These formulas are all shown on another copy of the printout of DRCFORMe titled text format. In this format, the formulas in each cell are displayed. It is clear that most values are computed by formulas by the computer, rather than entered by the analyst.

We have included a copy of the DRCFORMe which we used for our flower exporting firm. We entered the data from the questionnaire onto DRCFORMe and then saved this file under the name Bloome. It now includes all the data we obtained from the Blooming Bulbs questionnaire, and all of the values for the PAM and Pam ratios are shown on page 3 of the printout.

As can be seen from the printout, Blooming Bulbs has

private profits [D] of Sucres 33.3 million. It has economic profits [H] of Sucres 34.3 million. Its NPC is 1, its EPC is .93 and its DRC is .52.

C. Presentation of Results

There are at least two separate audiences for the results of private and economic profitability analysis. One audience is the owners or managers of the farm or firm which has been analyzed. The second audience is government policymakers.

1. Presentation of Results to the Firm

In the course of obtaining data from the firm, the general objectives and concepts of profitability analysis have been explained to the management of the firm. However, in presenting the results, it is essential that the analyst begin by briefly restating the basic concepts. At a minimum it should be pointed that private profitability reflects the profitability of the activity from the point of view of the firm, whereas economic profitability reflects the profitability or desirability of the activity from the viewpoint of the nation.

The firm should then be presented with the values for each element of the PAM and these each explained. The PAM for Blooming Bulbs is as follows (page 3 of the computer print-out):

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PAM for Blooming Bulbs

-----Costs-----

	<u>Revenue</u>	<u>Tradable Input</u>	<u>Factor</u>	<u>Profits</u>
Private Prices	91,139	24,581	33,299	33,260
Economic Prices	91,139	19,674	37,138	34,327
Policy Effects	0	-4,907	3,840	-1,067
	NPC = 1.0;	EPC = .93;	DRC = .52	

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The firm is both privately and economically profitable. Profitability is somewhat higher in economic prices than in private prices. Why? Because tradable input costs are substantially lower in economic prices than in private prices. This is because the firm must pay import duties on its imported inputs. Even though factor costs are higher in economic prices, the net effect is for costs to be lower in economic prices than in private prices.

The fact that the firm is economically profitable means that Ecuador has a comparative advantage in the activity: it is a net earner of foreign exchange. It should thus be encouraged rather than discouraged by government policies. But, as we can see, the net effect of government policies is to provide the firm with a net disincentive of Sucres 1.07 million. There

is no government policy affecting the firm's revenues, but tradable input costs are substantially higher in private prices than in economic prices due to the fact that the firm must pay import duties and sales taxes on its tradable inputs. Thus the firm receives a disincentive of Sucre 4.9 million from input policies.

This is partially offset by the fact that the firm received a loan from a government-owned bank at a rate of interest below the commercial rate. Thus policies affecting factor costs have provided an incentive effect of Sucre 3.8 million. Factor costs in economic prices are Sucre 3.8 million more than they are in private prices.

Since the firm is in fact economically efficient, it could use the results of this analysis to argue for more favorable policy treatment from government. The firm could ask for import duty relief, or perhaps additional credit at a favorable rate so that it can make its needed investments in a hot room and cold storage room.

The firm could also benefit from the possibility of carrying out sensitivity analysis on its private and economic profitability. It could for example change the exchange rate, or labor costs, or the rate of import duties on its principal input (bulbs), in order to see how this would affect its profitability. Since all of the data is on the microcomputer,

it is very easy to carry out this sensitivity analysis by simply changing the value in one or two cells and then pushing the "recalculation" button on the computer.

We have in fact carried out some of this sensitivity analysis for the firm. First, we assumed that the exchange rate devalued from Sucres 200 to 300. This of course raises the sucre value of its output as well as all of its tradable input costs. Its revised PAM values are as follows:

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PAM for Blooming Bulbs

		-----Costs-----		
	<u>Revenue</u>	<u>Tradable Input</u>	<u>Factor</u>	<u>Profits</u>
Private Prices	136,709	36,871	33,299	66,539
Economic Prices	136,709	29,511	37,138	70,060
Policy Effects	0	-7,360	3,840	-3,520

NPC = 1.0; EPC = .93; DRC = .35

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Note that the firm is now much more privately and economically profitable. This is because tradable output revenues and inputs have increased by 50 percent as a result of the devaluation, and, since revenues are greater than tradable input costs, the net effect is an increase in profitability. We have assumed no increase in wage costs, which may well be

the case in the short-run. But in the longer-run there undoubtedly would be an increase in labor costs. This could offset some of the increase in profitability resulting from the devaluation.

Next we assumed that the firm was able to grow its own bulbs at roughly half the cost of importing them, plus it no longer has to pay import duties on the bulbs. Its PAM values, assuming an exchange rate of Sucres 300 per dollar as well domestic bulbs, is as follows:

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                        PAM for Blooming Bulbs
                        -----Costs-----

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	<u>Revenue</u>	<u>Tradable Input</u>	<u>Factor</u>	<u>Profits</u>
Private Prices	136,709	24,721	33,299	76,689
Economic Prices	136,709	23,346	37,138	76,224
Policy Effects	0	-1,374	3,840	2,465
	NPC = 1.0;	EPC = .99;	DRC = .33	

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The firm's private and economic profitability have both increased and the DRC decreased from .35 to .33.

The firm should be encouraged to update the basic data entered into the computer as its revenues and costs change. Private and economic profitability analysis is most useful if

it is continuously updated. Once the analysis has been set up on the microcomputer, this is very easy to do.

2. Presentation of Results to Policymakers

The presentation of results to policymakers is quite similar to the presentation of the results to the firm. The major difference is that less emphasis is placed on private profitability, and more on economic profitability and policy effects. In most cases, the results of analysis on more than one activity are presented at the same time. In this way policymakers can compare and contrast the effects of their policies on different firms in the same sector, or firms in different sectors.

In most cases policymakers should be shown how they can carry out sensitivity analysis on the results. By so doing, they can consider the effect of alternative policy changes they may be contemplating on the private and economic profitability of different activities.

In the next chapter the results of private and economic profitability analysis which have been carried out for a variety of activities in Ecuador (and another country) are presented. Suggestions for effective ways to present these results to government policymakers are provided.

USAID QUESTIONNAIRE

The purpose of this questionnaire is to obtain information on the products that are produced by your firm. This information will help us to evaluate the contribution of your firm to foreign exchange earnings or savings. All the information given will be treated as confidential. Please provide us with the most recent information available.

Name of the firm: Blooming Bulbs Year of information: 1987

I. Revenues

1. Please name the three most important products produced by your firm.

Product 1: Liliums blooms

Product 2: _____

Product 3: _____

Please indicate the quantity and ex-factory price for each of the major products produced by your firm. If the product is exported, please indicate the FOB price, and for local sales indicate the ex-factory price excluding taxes.

1987 (Harvest)	Local Sales			Export Sales		
	Quantity	Price	Value (S/. mil)	Quantity	Price	Value (S/. mil)
Unit: <u>Bulbs</u>						
Product 1	<u>27,000</u>	<u>320</u>	<u>8,640</u>	<u>243,000</u>	<u>320</u>	<u>77,760</u>
Product 2	_____	_____	_____	_____	_____	_____
Product 3	_____	_____	_____	_____	_____	_____
Others	_____	_____	_____	_____	_____	_____
Total Sales			<u>8,640</u>			<u>77,760</u>
Other Revenues (excluding interest income)			<u>0</u>			<u>0</u>

2. Please indicate the exchange rate used to convert foreign currency values into sucres. S/.200/ \$

3. Please indicate the beginning inventory for semi-finished and finished products at the beginning and at the end of the year.

<u>Balance at the beginning of the year</u>	<u>Balance at the end of the year</u>
<u>Value</u> (S/. mil)	<u>Value</u> (S/. mil)
<u>2,367</u>	<u>7,106</u>

II. Input costs (All costs excluding labor and capital).

5. Please indicate the value of the main inputs used in the past year. In column 3 please indicate if they are purchased locally (L) or imported (I). If they are purchased locally by your firm, but imported by others, please indicate this as follows: L (I). In the last 2 columns indicate the value of taxes paid.

(1) <u>Inputs</u>	(2) <u>Values</u> (S/.)	(3) <u>Indicate if</u> <u>it is local</u> <u>or imported</u> (L o I)	(4) <u>Import taxes</u> <u>paid</u> (S/.)	(5) <u>Other</u> <u>Duties</u> <u>paid</u> (S/.)
<u>Bulbs</u>	<u>16,200</u>	<u>I</u>	<u>2,916</u>	<u>1,620</u>
<u>Fertilizers, etc.</u>	<u>2,535</u>	<u>N(I)</u>	<u>126.8</u>	<u>253.5</u>
<u>Cartons, Paper</u>	<u>936</u>	<u>N(I)</u>	<u>187.2</u>	<u>93.6</u>
<u>Overalls, Boots, etc.</u>	<u>321</u>	<u>N</u>		<u>32</u>

6. Please indicate for major inputs the beginning year and ending year inventory values.

<u>Beginning of the year</u> (S/. mil)	<u>End of the year</u> (S/. mil)
<u>585</u>	<u>1,708</u>

III. Energy Costs

	<u>Values</u> (S/.)	<u>Taxes</u> <u>Paid</u> (S/.)
Electricity	<u>240</u>	<u> </u>
Gasoline	<u> </u>	<u> </u>
Diesel	<u> </u>	<u> </u>
Other fuels	<u>450</u>	<u> </u>
Water	<u> </u>	<u> </u>

IV. Cost for Miscellaneous services

	<u>Values</u> (S/.)	<u>Taxes</u> <u>Paid</u> (S/.)
Costs of repair and maintenance	<u>1,068</u>	<u> </u>
Cost of Payments to subcontractors	<u> </u>	<u> </u>
Rent: Plant, Machinery and Equipment	<u> </u>	<u> </u>
Transportation Costs (own)	<u> </u>	<u> </u>
Transportation Costs (Sub-contractors)	<u> </u>	<u> </u>
Rent: Land and buildings	<u> </u>	<u> </u>
Insurance	<u>1,926</u>	<u> </u>
Other Service Costs (excluding amortization and interest)	<u>7,047</u>	<u> </u>

V. Labor Costs

7. Please indicate the number of employees and wages and other benefits paid, by major category of employee. Please also specify any labor taxes paid by the firm.

	<u>Number of Employees</u>	<u>Total of Wages and Benefits</u> (S/. mil)	<u>Taxes paid by employer</u> (S/. mil)
Unskilled	<u>3</u>	<u>720</u>	<u> </u>
Skilled	<u>10</u>	<u>4,050</u>	<u> </u>
Administrative	<u>2</u>	<u>16,560</u>	<u> </u>
TOTAL	<u> </u>	<u> </u>	<u> </u>

8. Please estimate the number of employees you would have hired, and wages and benefits you would have paid had there been no government employment, and wage legislation.

	<u>Number of Employees</u>	<u>Total Wages and Benefits Paid</u> (S/. mil)	<u>Cost of Benefits Paid</u> (S/. mil)
Unskilled	<u>(The same)</u>	<u> </u>	<u> </u>
Skilled	<u> </u>	<u> </u>	<u> </u>
Administrative	<u> </u>	<u> </u>	<u> </u>

VI. Investment Costs

9. Please indicate the current market value of all fixed assets. Also specify if the asset was bought locally or imported and provide estimates of import duties and other taxes paid.

	<u>Actual Market Value</u> (S/. mil)	<u>Local or Imported</u> (L o I)	<u>Import Duties Paid</u> (S/. mil)	<u>Other Taxes Paid</u> (S/. mil)
Land	1,350	_____	_____	_____
Buildings	8,459	_____	_____	_____
Machinery and tools	16,710	_____	_____	_____
vehicles	_____	_____	_____	_____
Furniture and fixtures	_____	_____	_____	_____
Others	_____	_____	_____	_____

VII. Working Capital (Total Current Assets - Total Current Liabilities)

10. Please indicate the value of the Working Capital.
S/. 11,455

11. What is the average interest rate paid on short-term loans or overdrafts? 18 % per annum.

12. What is the average interest rate paid on long-term loans?
25 % per annum.

VIII. Capacity Utilization

13. What was the firms estimated rate of capacity utilization during the past year? 100 %

14. If it was less than 100%, what were the major reasons?

A	B	C	D	E	F	G
2	Enterprise Name:					
3	FILE NAME: DRIFORMe	Units: Sucres	'000			
4	Period of Data:					
5	Capacity Utilization:	0				
6	Exchange Rate:	0				
7	Date of Analysis:	11-Feb-88				
8	(1)		(2)	(3)	(4)	
9	Item		Private	Conversion Factor	Economic	
10	-----		-----	-----	-----	
11	REVENUE, TRADABLES		0	----	0	
12	Total Domestic Sales Revenue		0		0	
13	1. Product 1		X	0.8	0	
14	2. Product 2		X		0	
15	3. Product 3		X		0	
16	4. All other products		X		0	
17	Total Export Sales Revenue		X		0	
18	Output Stocks Begin Year		X		0	
19	Output Stocks End Year		X		0	
20	NON-TRADABLE REVENUE		X		0	
21						
22	MATERIAL INPUTS, TRADABLE		0		0	
23	Total Local Purchases		X		0	
24	Total Imported Purchases		X		0	
25	Input Stocks Begin Year		X		0	
26	Input Stocks End Year		X		0	
27	NON-TRADABLE INPUTS		0		0	
28						
29	ENERGY COSTS		0	----	0	
30	Electricity		X	2	0	
31	Fuel		X	1	0	
32	Diesel		X		0	
33	Other Fuel		X		0	
34	Water		X		0	
35	Other or All				0	
36						
37	LABOR # / COSTS	0				
38	Non-skilled	X	X		0	
39	Skilled	X	X		0	
40	Managers	X	X		0	
41		---	0		0	
42	TOTAL CAPITAL ASSETS		0	----	0	
43	Land		X		0	
44	Buildings		X		0	
45	Plant, Machines, F&F		X		0	
46	Motor Vehicles		X		0	
47	Net Current Asset Value		X		0	
48						
49						
50						
51						
52						
53						

A	B	C	D	E	F	G
58						
59	Enterprise Name:					
60						
61	(1)		(2)	(3)	(4)	
62				Conversion		
63	Item		Private	Factor	Economic	
64	-----					
65	TOTAL SERVICES		0	----		0
66	Repair & Maint., Work Bldgs.		X			0
67	Repair & Maint., P&M		X			0
68	Subcontractor Work		X			0
69	Rents: Plant, Machin. & Equip.		X			0
70	Transport Costs, Own		X			0
71	Transport Costs, Hire		X			0
72	Rents: Buildings & Land		X			0
73	Head Office Expenses		X			0
74	Other Expenses		X			0
75	Capital		0			0
76	Labor		0			0
77	Tradable		0			0
78						
79	TOTAL TRADABLE REVENUES AND COSTS					
80						
81	Revenues		0			0
82						
83	Material Costs		0			0
84	Electricity		0			0
85	Oil products		0			0
86	Other		0			0
87	Service Tradable Component		0			0
88	Service Capital Component		0			0
89	Total Depreciation		0			0
90	Buildings		0			0
91	Plant, Machines, F&F		0			0
92	Motor Vehicles		0			0
93						
94	Total Tradable Costs		0			0
95						
96	DOMESTIC FACTOR COSTS					
97	Working Capital Costs	0.33	0	0		0
98	Land	0.33	0	0		0
99	Buildings		0			0
100	Plant, Machines, F&F		0			0
101	Motor Vehicles		0			0
102	Total Capital Costs		0			0
103						
104	Total Service Costs		0			0
105	Service Component		0			0
106	Other Including .2+Water		0			0
107	Total Labor Costs		0			0
108						
109	NONTRADABLES					
110	Revenues		0			0
111	Costs		0			0
112						
113						

A	B	C	D	E	F	G
117	Enterprise Name:					
118						
119	(1)		(2)	(3)	(4)	
120				Conversion		
121	Item		Private	Factor	Economic	
122	-----					
123	PRIVATE/ECONOMIC INDICATORS					
124						
125						
126	R(P) = Gross Output		0			
127	TIC(P) = Tradable Input Costs		0			
128	DFC(P) = Domestic Factor Costs		0			
129	Private Profitability		0			
130						
131						
132						
133	R(S) = Gross Output				0	
134	TIC(S) = Tradable Input Costs				0	
135	DFC(S) = Domestic Factor Costs				0	
136	Economic Profitability				0	
137						
138						
139						
140		R(P)	+R(P)			
141	NPC =	-----	-----	=	ERR	
142		R(S)	+R(S)			
143						
144						
145		R(P) - TIC(P)	0			
146	EPC =	-----	-----	=	ERR	
147		R(S) - TIC(S)	0			
148						
149						
150		DFC(S)	0			
151	DRC =	-----	-----	=	ERR	
152		R(S) - TIC(S)	0			
153						
154						
155	Capacity Utilization:+6					
156						
157		DFC(S)	0			
158	DRC(CU)=	-----	-----	=	ERR	
159		R(S) - TIC(S)	0			
160						

A	B	C	D	E	F
2					
3	Enterprise Name:		Units: Sucres '000		
4	FILE NAME:	DECFORM			
5	Period of data:				
6	Capacity Utilization	0			
7	Exchange rate:	0			
8	Date of Analysis:	10-Feb-88			
9					
10	Item		Private	Z	Economic
11					+F13+F18-F19+F20
12	REVENUE, TRADABLES	+D13+D18-D19+D20			@SUM(F14..F17)
13	Total Domestic Sales Revenue	@SUM(D14..D17)	+F13/D13		@IF(E14<0),(E14+D14),D14)
14	1. Product 1		0		@IF(E15<0),(E15+D15),D15)
15	2. Product 2		0		@IF(E16<0),(E16+D16),D16)
16	3. Product 3		0		@IF(E17<0),(E17+D17),D17)
17	4. All other products		0		@IF(E18<0),(E18+D18),D18)
18	Total Export Sales Revenue		0		@IF(E19<0),(E19+D19),D19)
19	Output Stocks Begin Year		0		@IF(E20<0),(E20+D20),D20)
20	Output Stocks End Year				
21			0		+ERR
22	NON-TRADABLE REVENUE				
23					+F25+F26+F27-F28
24	MATERIAL INPUTS, TRADABLE	+D25+D26+D27-D28			@IF(E25<0),(E25+D25),D25)
25	Total Local Purchases		0		@IF(E26<0),(E26+D26),D26)
26	Total Imported Purchases		0		@IF(E27<0),(E27+D27),D27)
27	Input Stocks Begin Year		0		@IF(E28<0),(E28+D28),D28)
28	Input Stocks End Year		0		
29			0		@IF(E30<0),(E30+D30),D30)
30	NON-TRADABLE INPUTS				
31					@SUM(F33..F38)-F37
32	ENERGY COSTS	@SUM(D33..D38)-D37			2.00 @IF(E33<0),(E33+D33),D33)
33	Electricity		0		1.22 @IF(E34<0),(E34+D34),D34)
34	Fuel		0		@IF(E35<0),(E35+D35),D35)
35	Diesel		0		@IF(E36<0),(E36+D36),D36)
36	Other fuel		0		@IF(E37<0),(E37+D37),D37)
37	Water		0		@IF(E38<0),(E38+D38),D38)
38	Other or all				
39					@IF(E40<0),(E40+D40),D40)
40	LABOR & COSTS	0	0		@IF(E41<0),(E41+D41),D41)
41	Non-skilled	0	0		@IF(E42<0),(E42+D42),D42)
42	Skilled	0	0		@IF(E43<0),(E43+D43),D43)
43	Managers	0	0		@IF(E44<0),(E44+D44),D44)
44					
45					@SUM(F47..F50)+@ABS(F51)
46	TOTAL CAPITAL ASSETS . . .	@SUM(D47..D50)+@ABS(D51)			@IF(E47<0),(E47+D47),D47)
47	Land		0		@IF(E48<0),(E48+D48),D48)
48	Buildings		0		@IF(E49<0),(E49+D49),D49)
49	Plant, Machines, F & F		0		@IF(E50<0),(E50+D50),D50)
50	Motor Vehicles		0		@IF(E51<0),@ABS((E51+D51)),@ABS(D51))
51	Net Current Asset value				
52					
53					
54					
55					
56					
57					
58					

((D40+1000)/E40)/12
 ((D41+1000)/E41)/12
 ((D42+1000)/E42)/12
 ((D43+1000)/E43)/12

Handwritten mark

59
60
61
62
63 Enterprise name:
64
65 TOTAL SERVICES @SUM(D66..D74)
66 Repair & maint. work bldgs
67 Repair & maint p & m
68 Subcontractor work
69 Rents: plant, mach & equip
70 Transport costs, own
71 Transport costs, hire
72 Rents: bldgs & land
73 Head office expenses
74 Other expenses
75 Capital
76 Labor
77 Tradable
78
79 TOTAL TRADABLE REVENUES AND COSTS
80
81 Revenues +D12
82
83 Material Costs +D24
84 Electricity +D33
85 Oil Products +D36+D35+D34
86 Other +D38+D37
87 Service Tradable Component +D77
88 Service Capital Component +D75
89 Total Depreciation -- @SUM(D90..D92)
90 Buildings +D48/40
91 Plant, Machines, F & F +D49/15
92 Motor Vehicles +D50/5
93
94 Total Tradable Costs. . @SUM(D83..D89)
95
96 DOMESTIC FACTOR COSTS
97 Working cap. cost 0.33 @ABS(D51)+@C497
98 Land 0.33 +C498+D47
99 Buildings +C498+D48
100 Plant, Machines, F & F +C498+D49
101 Motor Vehicles +C498+D50
102 Total Capital Costs . . @SUM(D97..D101)
103
104 Total Labor Costs +D40
105 Service component +D76
106 Other including .2 + water 0.2+D37
107 Total Labor Costs . . . @SUM(D104..D106)
108
109 NON-TRADABLES
110 Revenues +D22
111 Costs - +D30
112
113
114
115
**

(0.5+0.5*(D66))+(0.5+0.75*(D67))+(0.
(0.5+0.5*(D66))+(0.5+0.25*(D67))+(0.
(0.5+D66)+(0.5+D67)+(0.2+D68)+(0.1+D69

@SUM(F66..F74)
@IF (E66<0, (E66+D66), D66)
@IF (E67<0, (E67+D67), D67)
@IF (E68<0, (E68+D68), D68)
@IF (E69<0, (E69+D69), D69)
@IF (E70<0, (E70+D70), D70)
@IF (E71<0, (E71+D71), D71)
@IF (E72<0, (E72+D72), D72)
@IF (E73<0, (E73+D73), D73)
@IF (E74<0, (E74+D74), D74) @IF (@ISERR (D74/D65), 0, +D74/D65)
(0.5+0.5*(F66))+(0.5+0.75*(F67))+(0.8+0
(0.5+0.5*(F66))+(0.5+0.25*(F67))+(0.8+0
(0.5+F66)+(0.5+F67)+(0.2+F68)+(0.1+F69)+(

+F12
+F24
+F33
+F36+F35+F34
+F38+(0.8+F37)
+F77
+F75
@SUM(F90..F92)
+F48/40
+F49/15
+F50/5
@SUM(F83..F89)
0.33 @ABS(F51)+@E89?
0.33 +E498+F47
+E498+F48
+E498+F49
+E498+F50
@SUM(F97..F101)
+F40
+F76
0.2+F37
@SUM(F104..F106)

88

117
 118
 119
 120
 121 Enterprise name:
 122
 123 PRIVATE / ECONOMIC INDICATORS
 124
 125
 126 R(P) = Gross Output
 127 TIC(P) = Tradable Input Costs
 128 DFC(P) = Domestic Factor Costs
 129 Private Profitability
 130
 131
 132
 133 R(S) = Gross Output
 134 TIC(S) = Tradable Input Costs
 135 DFC(S) = Domestic Factor Costs
 136 Economic Profitability
 137
 138
 139
 140
 141
 142
 143
 144
 145
 146
 147
 148
 149
 150
 151
 152
 153
 154 Capacity utilization: +C6
 155
 156
 157
 158
 159
 160

Private Values

+D81+D110
 +D94+D111
 +D102+D107
 +R(P)-TIC(P)-DFC(P)

Economic Values

+F81+F110
 +F94+F111
 +F102+F107
 +R(S)-TIC(S)-DFC(S)

$$MPC = \frac{R(P)}{R(S)} = \frac{+R(P)}{+R(S)} = \frac{+C139/C141}{}$$

$$EPC = \frac{R(P) - TIC(P)}{R(S) - TIC(S)} = \frac{+R(P)-TIC(P)}{+R(S)-TIC(S)} = \frac{+D144/D146}{}$$

$$ERC = \frac{DFC(S)}{R(S) - TIC(S)} = \frac{+DFC(S)}{+R(S)-TIC(S)} = \frac{+D149/D151}{}$$

154 Capacity utilization: +C6

$$DRC(cu) = \frac{DFC(S)}{R(S) - TIC(S)} = \frac{+D149}{+R(S)-TIC(S)+((1-C154)*@SUM(F70..F92))} = \frac{+D156/D158}{}$$

A	B	C	D	E	F	G
1						
2						
3	Enterprise Name:	Blooming	Bulbs			
4	FILE NAME:	Bloome	Units:	Sucres	'000	
5	Period of Data:	Cal Yr	87			
6	Capacity Utilization:	1				
7	Exchange Rate:	200				
8	Date of Analysis:	11-Feb-88				
9	(1)		(2)	(3)	(4)	
10				Conversion		
11	Item		Private	Factor	Economic	
12	-----			-----	-----	
13	REVENUE, TRADABLES		91,139	----	91,139	
14	Total Domestic Sales Revenue		8,640		8,640	
15	1. Product 1		8,640		8,640	
16	2. Product 2		0		0	
17	3. Product 3		0		0	
18	4. All other Products		0		0	
19	Total Export Sales Revenue		77,760		77,760	
20	Output Stocks Begin Year		2,367		2,367	
21	Output Stocks End Year		7,106		7,106	
22						
23	NON-TRADABLE REVENUE		0		0	
24						
25	MATERIAL INPUTS, TRADABLE		18,869		13,722	
26	Total Local Purchases		321	0.90	289	
27	Total Imported Purchases		19,671	0.74	14,557	
28	Input Stocks Begin Year		585		585	
29	Input Stocks End Year		1,708		1,708	
30						
31	NON-TRADABLE INPUTS		0		0	
32						
33	ENERGY COSTS		691	----	931	
34	Electricity		240	2.00	480	
35	Fuel		0	1.22	0	
36	Diesel		0		0	
37	Other Fuel		450		450	
38	Water		1		1	
39	Other or All		0		0	
40	LABOR # / COSTS	15	22,230		22,230	
41	Non-skilled	3	720		720	
42	Skilled	10	4,950		4,950	
43	Managers	2	16,560		16,560	
44		---	0		0	
45						
46	TOTAL CAPITAL ASSETS		37,974	----	37,974	
47	Land		1,350		1,350	
48	Buildings		8,459		8,459	
49	Plant, Machines, F&F		16,710		16,710	
50	Motor Vehicles		0		0	
51	Net Current Asset Value		11,455		11,455	
52						
53						

A	B	C	D	E	F	G
58	Enterprise Name: Blooming Bulbs					
59						
60	(1)		(2)	(3)	(4)	
61				Conversion		
62	Item		Private	Factor	Economic	
63	-----					
64	TOTAL SERVICES		10,041	----	10,041	
65	Repair & Maint., Work Bldgs.		0		0	
66	Repair & Maint., P&M		1,068		1,068	
67	Subcontractor Work		0		0	
68	Rents: Plant, Machin. & Equip.		0		0	
69	Transport Costs, Own		0		0	
70	Transport Costs, Hire		0		0	
71	Rents: Buildings & Land		0		0	
72	Head Office Expenses		0		0	
73	Other Expenses		8,973		8,973	
74	Capital		2,644		2,644	
75	Labor		2,377		2,377	
76	Tradable		5,021		5,021	
77						
78	TOTAL TRADABLE REVENUES AND COSTS					
79						
80	Revenues		91,139		91,139	
81						
82	Material Costs		18,869		13,722	
83	Electricity		240		480	
84	Oil products		450		450	
85	Other		1		1	
86	Service Tradable Component		5,021		5,021	
87	Service Capital Component		2,644		2,644	
88	Total Depreciation		0		0	
89	Buildings		0		0	
90	Plant, Machines, F&F		0		0	
91	Motor Vehicles		0		0	
92						
93	Total Tradable Costs		24,581		19,674	
94						
95	DOMESTIC FACTOR COSTS					
96						
97	Working Capital Costs	0.18	2,062	0.33	3,780	
98	Land	0.25	338	0.33	446	
99	Buildings		2,115		2,791	
100	Plant, Machines, F&F		4,178		5,514	
101	Motor Vehicles		0		0	
102	Total Capital Costs		8,692		12,531	
103						
104	Total Service Costs		22,230		22,230	
105	Service Component		2,377		2,377	
106	Other Including .2+Water		0		0	
107	Total Labor Costs		24,607		24,607	
108						
109	NONTRADABLES					
110	Revenues		0		0	
111	Costs		0		0	
112						
113						

A	B	C	D	E	F	G
117	Enterprise Name:					
118						
119	(1)		(2)	(3)	(4)	
120				Conversion		
121	Item		Private	Factor	Economic	
122	-----					
123	PRIVATE/ECONOMIC INDICATORS					
124						
125	R(P) = Gross Output		91,139			
126	TIC(P) = Tradable Input Costs		24,581			
127	DFC(P) = Domestic Factor Costs		33,299			
128	Private Profitability		33,260			
129						
130	R(S) = Gross Output				91,139	
131	TIC(S) = Tradable Input Costs				19,674	
132	DFC(S) = Domestic Factor Costs				37,138	
133	Economic Profitability				34,327	
134						
135						
136						
137		R(P)	+R(P)			
138	NPC =	-----	-----	=	1.00	
139		R(S)	+R(S)			
140						
141						
142		R(P) - TIC(P)	66,559			
143	EPC =	-----	-----	=	0.93	
144		R(S) - TIC(S)	71,465			
145						
146						
147		DFC(S)	37,138			
148	DRC =	-----	-----	=	0.52	
149		R(S) - TIC(S)	71,465			
150						
151						
152	Capacity Utilization:+C6					
153						
154		DFC(S)	37,138			
155	DRC(CU)=	-----	-----	=	0.52	
156		R(S) - TIC(S)	71,465			
157						
158						
159						
160						

A	B	C	D	E	F	G
1						
2						
3	Enterprise Name:	Blooming Bulbs				
4	FILE NAME:	Bloome	Units:	Sucres '000		
5	Period of Data:	Cal Yr 87				
6	Capacity Utilization:	1				
7	Exchange Rate:	300				
8	Date of Analysis:	11-Feb-88				
9	(1)		(2)	(3)	(4)	
10				Conversion		
11	Item		Private	Factor	Economic	
12	-----		-----	-----	-----	
13	REVENUE, TRADABLES		91,139	----	91,139	
14	Total Domestic Sales Revenue		8,640		8,640	
15	1. Product 1		8,640		8,640	
16	2. Product 2		0		0	
17	3. Product 3		0		0	
18	4. All other Products		0		0	
19	Total Export Sales Revenue		77,760		77,760	
20	Output Stocks Begin Year		2,367		2,367	
21	Output Stocks End Year		7,106		7,106	
22						
23	NON-TRADABLE REVENUE		0		0	
24						
25	MATERIAL INPUTS, TRADABLE		18,869		13,722	
26	Total Local Purchases		321	0.90	289	
27	Total Imported Purchases		19,671	0.74	14,557	
28	Input Stocks Begin Year		585		585	
29	Input Stocks End Year		1,708		1,708	
30						
31	NON-TRADABLE INPUTS		0		0	
32						
33	ENERGY COSTS		691	----	931	
34	Electricity		240	2.00	480	
35	Fuel		0	1.22	0	
36	Diesel		0		0	
37	Other Fuel		450		450	
38	Water		1		1	
39	Other or All		0		0	
40	LABOR # / COSTS	15	22,230		22,230	
41	Non-skilled	3	720		720	
42	Skilled	10	4,950		4,950	
43	Managers	2	16,560		16,560	
44		---	0		0	
45						
46	TOTAL CAPITAL ASSETS		37,974	----	37,974	
47	Land		1,350		1,350	
48	Buildings		8,459		8,459	
49	Plant, Machines, F&F		16,710		16,710	
50	Motor Vehicles		0		0	
51	Net Current Asset Value		11,455		11,455	
52						
53						

A	B	C	D	E	F	G
58	Enterprise Name: Blooming Bulbs					
59						
60	(1)		(2)	(3)	(4)	
61				Conversion		
62	Item		Private	Factor	Economic	
63	-----					
64	TOTAL SERVICES		10,041	----	10,041	
65	Repair & Maint., Work Bldgs.		0		0	
66	Repair & Maint., P&M		1,068		1,068	
67	Subcontractor Work		0		0	
68	Rents: Plant, Machin. & Equip.		0		0	
69	Transport Costs, Own		0		0	
70	Transport Costs, Hire		0		0	
71	Rents: Buildings & Land		0		0	
72	Head Office Expenses		0		0	
73	Other Expenses		8,973		8,973	
74	Capital		2,644		2,644	
75	Labor		2,377		2,377	
76	Tradable		5,021		5,021	
77						
78	TOTAL TRADABLE REVENUES AND COSTS					
79						
80	Revenues		91,139		91,139	
81						
82	Material Costs		18,869		13,722	
83	Electricity		240		480	
84	Oil products		450		450	
85	Other		1		1	
86	Service Tradable Component		5,021		5,021	
87	Service Capital Component		2,644		2,644	
88	Total Depreciation		0		0	
89	Buildings		0		0	
90	Plant, Machines, F&F		0		0	
91	Motor Vehicles		0		0	
92						
93	Total Tradable Costs		24,581		19,674	
94						
95	DOMESTIC FACTOR COSTS					
96						
97	Working Capital Costs	0.18	2,062	0.33	3,780	
98	Land	0.25	338	0.33	446	
99	Buildings		2,115		2,791	
100	Plant, Machines, F&F		4,178		5,514	
101	Motor Vehicles		0		0	
102	Total Capital Costs		8,692		12,531	
103						
104	Total Service Costs		22,230		22,230	
105	Service Component		2,377		2,377	
106	Other Including .2+Water		0		0	
107	Total Labor Costs		24,607		24,607	
108						
109	NONTRADABLES					
110	Revenues		0		0	
111	Costs		0		0	
112						
113						

A	B	C	D	E	F
117	Enterprise Name:				
118					
119	(1)		(2)	(3)	(4)
120				Conversion	
121	Item		Private	Factor	Economic
122	-----				
123	PRIVATE/ECONOMIC INDICATORS				
124					
125	R(P) = Gross Output		136,709		
126	TIC(P) = Tradable Input Costs		36,871		
127	DFC(P) = Domestic Factor Costs		33,299		
128	Private Profitability		66,539		
129					
130	R(S) = Gross Output				136,709
131	TIC(S) = Tradable Input Costs				29,511
132	DFC(S) = Domestic Factor Costs				37,138
133	Economic Profitability				70,060
134					
135					
136					
137		R(P)	+R(P)		
138	NPC =	-----	-----	=	1.00
139		R(S)	+R(S)		
140					
141					
142		R(P) - TIC(P)	99,838		
143	EPC =	-----	-----	=	0.93
144		R(S) - TIC(S)	107,198		
145					
146					
147		DFC(S)	37,138		
148	DRC =	-----	-----	=	0.35
149		R(S) - TIC(S)	107,198		
150					
151					
152	Capacity Utilization:+C6				
153					
154		DFC(S)	37,138		
155	DRC(CU)=	-----	-----	=	0.35
156		R(S) - TIC(S)	107,198		
157					
158					
159					
160					

A	B	C	D	E	F	G
1						
2						
3	Enterprise Name: Blooming Bulbs					
4	FILE NAME: Bloome Units: Sucres '000					
5	Period of Data: Cal Yr 87					
6	Capacity Utilization:	1	SENSITIVITY: 50% DEVALUATION &			
7	Exchange Rate:	300	===== PURCHASE DOMESTIC			
8	Date of Analysis: 11-Feb-88					
9	(1)		(2)	(3)	(4)	
10				Conversion		
11	Item		Private	Factor		Economic
12	-----					
13	REVENUE, TRADABLES		91,139	----		91,139
14	Total Domestic Sales Revenue		8,640			8,640
15	1. Product 1		8,640			8,640
16	2. Product 2		0			0
17	3. Product 3		0			0
18	4. All other Products		0			0
19	Total Export Sales Revenue		77,760			77,760
20	Output Stocks Begin Year		2,367			2,367
21	Output Stocks End Year		7,106			7,106
22						
23	NON-TRADABLE REVENUE		0			0
24						
25	MATERIAL INPUTS, TRADABLE		10,769			9,613
26	Total Local Purchases		8,421	0.90		7,579
27	Total Imported Purchases		3,471	0.91		3,157
28	Input Stocks Begin Year		585			585
29	Input Stocks End Year		1,708			1,708
30						
31	NON-TRADABLE INPUTS		0			0
32						
33	ENERGY COSTS		691	----		931
34	Electricity		240	2.00		480
35	Fuel		0	1.22		0
36	Diesel		0			0
37	Other Fuel		450			450
38	Water		1			1
39	Other or All		0			0
40	LABOR # / COSTS	15	22,230			22,230
41	Non-skilled	3	720			720
42	Skilled	10	4,950			4,950
43	Managers	2	16,560			16,560
44		---	0			0
45						
46	TOTAL CAPITAL ASSETS		37,974	----		37,974
47	Land		1,350			1,350
48	Buildings		8,459			8,459
49	Plant, Machines, F&F		16,710			16,710
50	Motor Vehicles		0			0
51	Net Current Asset Value		11,455			11,455
52						
53						

A	B	C	D	E	F	G
58	Enterprise Name: Blooming Bulbs					
59						
60	(1)		(2)	(3)	(4)	
61				Conversion		
62	Item		Private	Factor	Economic	
63	-----					
64	TOTAL SERVICES		10,041	----	10,041	
65	Repair & Maint., Work Bldgs.		0		0	
66	Repair & Maint., P&M		1,068		1,068	
67	Subcontractor Work		0		0	
68	Rents: Plant, Machin. & Equip.		0		0	
69	Transport Costs, Own		0		0	
70	Transport Costs, Hire		0		0	
71	Rents: Buildings & Land		0		0	
72	Head Office Expenses		0		0	
73	Other Expenses		8,973		8,973	
74	Capital		2,644		2,644	
75	Labor		2,377		2,377	
76	Tradable		5,021		5,021	
77						
78	TOTAL TRADABLE REVENUES AND COSTS					
79						
80	Revenues		91,139		91,139	
81						
82	Material Costs		10,769		9,613	
83	Electricity		240		480	
84	Oil products		450		450	
85	Other		1		1	
86	Service Tradable Component		5,021		5,021	
87	Service Capital Component		2,644		2,644	
88	Total Depreciation		0		0	
89	Buildings		0		0	
90	Plant, Machines, F&F		0		0	
91	Motor Vehicles		0		0	
92						
93	Total Tradable Costs		16,481		15,564	
94						
95	DOMESTIC FACTOR COSTS					
96						
97	Working Capital Costs	0.18	2,062	0.33	3,780	
98	Land	0.25	338	0.33	446	
99	Buildings		2,115		2,791	
100	Plant, Machines, F&F		4,178		5,514	
101	Motor Vehicles		0		0	
102	Total Capital Costs		8,692		12,531	
103						
104	Total Service Costs		22,230		22,230	
105	Service Component		2,377		2,377	
106	Other Including .2+Water		0		0	
107	Total Labor Costs		24,607		24,607	
108						
109	NONTRADABLES					
110	Revenues		0		0	
111	Costs		0		0	
112						
113						

A	B	C	D	E	F	G
117	Enterprise Name:					
118						
119	(1)		(2)	(3)	(4)	
120	Item		Private	Conversion Factor	Economic	
121						
122	-----					
123	PRIVATE/ECONOMIC INDICATORS					
124						
125	R(P) = Gross Output		136,709			
126	TIC(P) = Tradable Input Costs		24,721			
127	DFC(P) = Domestic Factor Costs		33,299			
128	Private Profitability		78,689			
129						
130	R(S) = Gross Output				136,709	
131	TIC(S) = Tradable Input Costs				23,346	
132	DFC(S) = Domestic Factor Costs				37,138	
133	Economic Profitability				76,224	
134						
135						
136						
137						
138	NPC = $\frac{R(P)}{R(S)} = \frac{+R(P)}{+R(S)}$					1.00
139						
140						
141						
142						
143	EPC = $\frac{R(P) - TIC(P)}{R(S) - TIC(S)} = \frac{111,988}{113,362}$					0.99
144						
145						
146						
147						
148	DRC = $\frac{DFC(S)}{R(S) - TIC(S)} = \frac{37,138}{113,362}$					0.33
149						
150						
151						
152	Capacity Utilization: +C6					
153						
154						
155	DRC(CU) = $\frac{DFC(S)}{R(S) - TIC(S)} = \frac{37,138}{113,362}$					0.33
156						
157						
158						
159						
160						

Chapter 4

Comparison of Profitability and Efficiency Indicators for Different Activities

In this concluding chapter we provide guidelines on how to present the results of private and economic analyses which have been carried out for a number of different activities.

It is almost always useful for analysts to carry out profitability analysis on more than one activity. It is rare that the interest of policymakers is focused so narrowly as to be concerned with only one activity. It also assists in one's assessment of any one activity to compare its profitability and efficiency indicators with those of other farms or firms in the same sector, and to compare the results between sectors.

For example, we were interested in examining the economic efficiency of nontraditional export firms in Ecuador, and in assessing how these firms are affected by current government policies. While it is useful to know that one flower firm is economically efficient (DRC = .54), it is also instructive to be able to compare its results with those of other nontraditional exporters.

Time constraints only allowed us to carry profitability analyses for 7 activities. In this chapter's first section we indicate how one could present these results to policymakers.

In the second section we present the results of a more comprehensive private and economic profitability analysis which the economic consultant did for the manufacturing sector in Zimbabwe. It gives the reader some understanding of the sample size required in order to be able to provide policymakers with results representative of various subsectors of an economy. It also provides an indication of the extent to which efficiency indicators and policy effects can vary between activities in an economy.

A. Results for Nontraditional Exporters in Ecuador

Table 4.1 summarizes the private and economic profitability indicators for the seven firms in our sample. The results are not provided for each firm separately because the firms were promised confidentiality of their revenue and cost data. One cannot thus present the results in detail as we did for the flower firm in the last chapter (that firm gave us permission to present its actual revenue and cost data).

Normally, one would not ask firms to allow such detailed information to be released. That degree of detail is not necessary to provide policymakers with indications of private and economic profitability and with the effects of policy.

In Table 4.1 we have aggregated the results for seven firms into four subsectors. The first subsector is our

flower exporter. The next subsector, textiles, is an average of the results of 2 firms analyzed--one producing yarn and the other garments that contain the other firm's yarn as an input. The third subsector, wood building materials, is an average of the results of two firms that produce such materials. The fourth subsector is wood furniture; the indicators are the average for 2 such firms.

=====

Table 4.1

Summary Results for Ecuadorian Nontraditional Export Firms

<u>Sub-Sector/Indicator</u>	<u>Flowers</u>	<u>Textiles</u>
A - Revenue (in private prices)	91,139	476,421
B - Tradable Input Costs (in private prices)	23,809	221,014
C - Domestic Factor Costs (in private prices)	34,801	173,982
D - Private Profitability	32,529	81,426
E - Revenue (in economic prices)	91,139	502,005
F - Tradable Input Costs (in economic prices)	18,903	208,697
G - Domestic Factor Costs (in economic prices)	38,845	211,281
H - Economic Profitability	33,391	82,027

Table 4.1 (continued)

<u>Sub-Sector/Indicator</u>	<u>Flowers</u>	<u>Textiles</u>
I - Output Policy Effects	0	-25,584
J - Tradable Input Policy Effects	-4,906	-12,317
K - Domestic Factor Policy Effects	4,044	37,300
L - Net Policy Effects	-862	-601
Nominal Protection Coefficient (NPC)	1.00	0.97
Effective Protection Coefficient (EPC)	0.93	0.93
Domestic Resource Cost Ratio (DRC)	0.54	0.74
Capacity Utilization Adjusted DRC (DRC CU)	0.54	0.66
Percentage Capacity Utilization	100.0%	70.0%
Percentage of Output Exported	85.3%	3.5%
Import Content of Tradable Inputs	98.4%	41.2%
Gross Output per Employee (Sucres thousand)	€ ,076	10,388

Table 4.1 (continued)

Summary Results for Ecuadorian Nontraditional Export Firms

<u>Sub-Sector/Indicator</u>	<u>Wood Building Materials</u>	<u>Wood Furniture</u>	<u>Total</u>
A - Revenue (in private prices)	972,387	86,035	406,495
B - Tradable Input Costs (in private prices)	550,642	44,024	209,872
C - Domestic Factor Costs (in private prices)	439,000	90,367	184,537
D - Private Profitability	-17,256	-48,356	12,086
E - Revenue (in economic prices)	1,071,000	93,920	439,516
F - Tradable Input Costs (in economic prices)	547,593	43,670	204,716
G - Domestic Factor Costs (in economic prices)	621,879	106,424	244,607
H - Economic Profitability	-98,472	-56,173	-9,807
I - Output Policy Effects	-98,614	-7,885	-33,021
J - Tradable Input Policy Effects	-3,049	-354	-5,156
K - Domestic Factor Policy Effects	182,879	16,057	60,070
L - Net Policy Effects	81,216	7,818	21,893

Table 4.1 (continued)

<u>Sub-Sector/Indicator</u>	<u>Wood Building Materials</u>	<u>Wood Furniture</u>	<u>Total</u>
Nominal Protection Coefficient (NPC)	0.92	0.92	0.95
Effective Protection Coefficient (EPC)	0.82	0.87	0.89
Domestic Resource Cost Ratio (DRC)	1.30	2.47	1.26
Capacity Utilization Adjusted DRC (DRC CU)	1.12	1.14	0.87
Percentage Capacity Utilization	79.0%	35.5%	71.1%
Percentage of Output Exported	32.3%	4.8%	31.5%
Import Content of Tradable Inputs	51.2%	14.5%	51.3%
Gross Output per Employee (Sucre thousand)	5,258	1,156	5,720

Although we can compare and contrast the results for the four subsectors for the purpose of providing guidelines on presentation, our sample size of two per subsector is inadequate for generalizing these results for each of the subsectors. We do so here only for the purpose of illustration. In reality,

we would continue to add activities to our sample until the number of firms analyzed represented at least 60 to 75 percent of value added and employment in the subsector.

Results for the flower subsector were already presented in Chapter 3. Table 4.1 shows that flowers is the most efficient of the four subsectors studied. Its DRC is .54 while the DRCs for the other three subsectors are .74 (textiles), 1.30 (wood building materials), and 2.47 (wood furniture). Flowers is also the only subsector operating at full capacity utilization, and the one which exported the highest percentage of its production (85 percent). It also has the highest import content in its tradable inputs (98.4 percent). Lastly, flowers' gross output per employee is next to the highest of the four subsectors, indicating that it is not a very labor intensive activity.

Both textile firms, with DRCs of 0.76 and 0.72 are economically efficient. One of these firms is currently exporting and the other intends to do so shortly. Because the nonexporting firm is operating at less than 50 percent of capacity, exports will enable it to substantially improve its capacity utilization and thus lower its costs. The import content of the tradable inputs of the two textile firms vary widely. While imports account for only 4 percent of the tradable inputs cost of the garment firm which uses the other firm's yarn as an input, they account for nearly 80 percent of the tradable inputs

cost of the yarn producing firm. These two firms will therefore be very differently affected by any tightening of import restrictions.

At present both textile firms are economically efficient [H positive or DRCs < 1], even though they receive a negative incentive from government policies [L negative]. This disincentive comes from taxes on tradable inputs, and is only partially offset by loans at less than market rates of interest.

The garment firm has a gross output per employee nearly ten times lower than that of the yarn firm (i.e., is nearly ten times more labor intensive). It will thus be much more adversely affected by wage increases than will the yarn firm, which was the least labor intensive of all 7 firms analyzed.

Of the two manufacturers of wood building materials, one produces plywood and the other particleboard. They too have widely varying indicators. One firm is efficient with a DRC of 0.91, while the other has a DRC of 1.69 and is therefore inefficient. The efficient firm receives a net disincentive from government policies [L negative], while the inefficient firm receives a net incentive from government policies [L positive]. This result is unfortunately quite common in profitability analysis.

The fact that inefficient firms are receiving positive incentives from government policies should serve as a catalyst

for considerations of policy changes--unless of course the inefficient firm is making contributions to employment or regional balance which are offsetting its inefficiency. In the case of the wood building material firms, the inefficient one is second to the least labor intensive firm but it is situated in a less developed region.

The inefficient producer of wood building materials was operating at only about 75 percent of full capacity in 1987 and exported only 15 percent of its output. If it increases its exports in 1988, which it intends to do, its capacity utilization should improve. This firm's DRC would decline to 1.39 if it were to operate at full capacity.

One major reason for this firm's inefficiency may be its sizable investment in plant and machinery. Its annual capital costs are quite high in economic prices, since we attain this value by applying the present interest rate of 35 percent to the current market value of its fixed assets. If the current market value of the firm's fixed assets were 40 percent less, its DRC would be reduced to 0.98.

Because the import content of this firm's tradable input costs is over 90 percent, it will be adversely affected by any import restrictions or increases in import duties. We must be aware that the adoption or increases of import duties will only affect the firm's private profitability, not its efficiency

(economic profitability), because when calculating economic prices, taxes are excluded from costs. Firms such as this one, with a high percentage of imported inputs, will be more severely affected by devaluations of the national currency than will firms with less dependence on imported inputs.

The widely differing efficiency results of the two manufacturers of wood building materials underlies the need to avoid generalizations from the results of one or two firms to the entire subsector. From our analysis one cannot conclude that Ecuador does or does not have a comparative advantage in the manufacture of these materials. One firm is efficient and the other is not. Before we can draw any conclusions regarding the efficiency of the subsector, it is necessary to extend this analysis to other producers of wood building materials.

We also examined two wood furniture manufacturers. With an average DRC of 2.47, this subsector was the least efficient of the four analyzed. Again, however, the results vary considerably between the two firms.

One firm has a DRC very close to one, and in fact would be efficient if it were operating at full capacity utilization. Because this firm has not exported any of its furniture, we conservatively estimated its f.o.b. export price at only 10 percent above domestic prices. It is quite possible that this firm will become efficient once it begins exporting, even if it

operates at less than full capacity (a firm in the U.S.A. has expressed an interest in importing furniture from this firm at prices over 40 percent higher than the firm is presently receiving on the domestic market).

The other wood furniture manufacturer, with a DRC greater than 3, is extremely inefficient in spite of the fact that it received a positive incentive effect from government policies. The firm is quite labor intensive (as is the other furniture manufacturer), it does not thus appear that its high investment in plant and equipment is the source of its inefficiency. Since the firm is highly unprofitable in both private and economic prices, it would seem that its problem is the result of costs substantially higher than its sales revenue. Before this manufacturer is provided with more incentives in the form of loans at low interest rates, policymakers should encourage this firm to examine its product line and costs.

Even from our small sample of seven firms, the results of private and economic profitability analysis can provide useful insights regarding the relative and absolute efficiency of various activities, as well as the impact of different policies on these activities. We have seen that firms will be differently affected by policy changes that influence labor costs, the exchange rate, import restrictions, or interest rates. Thus, any policy changes in these areas should be carefully assessed.

It is hoped that this discussion of our limited sample will encourage policymakers in Ecuador (and elsewhere) to have private and economic profitability analyses carried out for a large sample of farms and firms. It is extremely useful to compare profitability results between subsectors in the agricultural and manufacturing subsectors, and also between exporting and import substituting farms and firms.

B. Results for the Manufacturing Sector in Zimbabwe

A private and economic profitability analysis, utilizing the methodology presented in this handbook, was prepared by the economic consultant for the Ministry of Industry and Energy Development of the Government of Zimbabwe in 1983. The primary objectives of the study were (a) to provide the government with an analysis of the strengths and weaknesses of the manufacturing sector at that time, (b) to examine the effects of government policies on that sector, and (c) to recommend policies that might be more effective in meeting the government's objectives.

Over the course of one year, three individuals conducted a detailed survey of 122 firms, chosen to represent the ten major manufacturing groups. In 1981 those 122 firms accounted for 62 percent of the net output of manufacturing and 51 percent of manufacturing employment.

Table 4.2 presents the incentive and comparative advantage indicators for ten groups and 33 products in manufacturing. Column 1 indicates the percentage share of each group and activity in total value added in manufacturing, valued in economic prices. These shares are used as weights in obtaining the average comparative advantage indicators for groups and for manufacturing as a whole.

Column 2 shows that with the exception of Foodstuffs, government policies that affect the prices of firms' output have provided a net incentive [I positive]. The nominal protection coefficients [NPCs] are one or greater for all groups (except Foodstuffs) and average 1.09 for the sample. This is a very low level of protection. It indicates that the revenues of the firms were on average 9 percent higher in private prices than in economic prices--or 9 percent higher with government policy than they would have been in the absence of government policy.

The net incentive effect of government policy is seen to be greater when the effect of government policy on tradable input costs is also incorporated. This combined effect is measured by the effective protection coefficients [EPCs], which are presented in column 3. The EPCs average 1.33 for manufacturing, but there are significant variations between the ten groups. The EPC is lowest for Foodstuffs, 0.86 (Group I), and highest for Paper, Printing and Publishing, 1.90 (Group VI).

Table 4.2

Zimbabwe: Incentive and Comparative Advantage Indicators

<u>Group/Product</u>	<u>VA Share</u>	<u>NPC</u>	<u>EPC</u>	<u>DRC</u>	<u>Capacity Util. (%)</u>	<u>Gross Output/ Employ. (Z\$000)</u>	<u>Ave. Wage (Z\$)</u>
I. Foodstuff	21	0.94	0.86	0.88	88	27	2,471
1. Meat	7	0.93	0.73	0.69	85	30	
2. Grains, Feeds	6	0.96	1.02	1.03	100	31	
3. Bakery Prod.	1	1.00	1.04	0.70	61	20	
4. Dairy Prod.	3	1.00	1.04	1.11	92	17	
5. Sugar Ref.	2	0.83	0.44	0.83	88	26	
6. Other Food	2	0.95	0.83	0.74	100	44	
II. Beverage	10	1.00	1.04	0.88	79	20	3,495
1. Beer, Wine	6	0.89	0.88	0.66	82	24	
2. Soft Drinks	1	1.11	1.48	1.32	75	13	
3. Tobacco	3	1.09	1.19	1.13	76	24	
III. Textiles	11	1.18	1.74	1.28	81	23	2,074
1. Cotton (CMB)	9	1.17	1.79	1.30	82	28	
2. Cotton	4	1.39	2.54	1.72	79	18	
3. Knitted Prod.	2	1.24	1.50	1.20	76	11	
IV. Clothing	8	1.19	1.28	1.05	86	12	1,954
1. Clothing	3	1.27	1.43	1.32	84	10	
2. Footwear	5	1.14	1.21	0.92	87	13	

Table 4.2 (continued)

<u>Group/Product</u>	<u>VA Share</u>	<u>NPC</u>	<u>EPC</u>	<u>DRC</u>	<u>Capacity Util. (%)</u>	<u>Gross Output/ Employ. (Z\$000)</u>	<u>Ave. Wage (Z\$)</u>
V. Wood	3	1.21	1.38	1.33	65	5	1,425
1. Wooden Prod.	2	1.19	1.35	1.33	62	4	
2. Furniture	1	1.23	1.45	1.32	69	8	
VI. Paper Prod.	3	1.32	1.90	1.87	87	20	4,391
1. Paper Prod.	2	1.33	2.30	2.40	92	22	
2. Printing	2	1.30	1.52	1.36	79	17	
VII. Chemicals	20	1.08	1.29	0.94	88	38	4,196
1. Fertilizer	7	0.99	1.17	0.83	96	48	
2. Soaps	5	1.05	1.10	0.81	100	50	
3. Pharmaceut.	1	1.13	1.36	1.19	93	42	
4. Paints	2	1.24	1.57	1.17	75	24	
5. Rubber Prod.	2	1.23	1.56	1.21	70	35	
6. Plastics	2	1.25	1.54	0.95	78	21	
VIII. Non-Metal Min. Products	5	1.12	1.25	0.98	85	12	2,196
1. Pottery		1.03	1.13	1.07	64	4	
2. Glass Prod.	1	1.07	1.20	0.68	94	17	
3. Cement	3	1.15	1.29	1.08	84	13	

Table 4.2 (continued)

<u>Group/Product</u>	<u>VA Share</u>	<u>NPC</u>	<u>EPC</u>	<u>DRC</u>	<u>Capacity Util. (%)</u>	<u>Gross Output/ Employ. (Z\$000)</u>	<u>Ave. Wage (Z\$)</u>
IX. Metal Prod.	18	1.20	1.77	2.41	78	22	3,329
1. Steel (ZISC)	9	1.18	2.03	3.62	86	30	
2. Steel	4	1.15	2.23	2.69	90	53	
3. Heavy Equip.	2	1.33	1.71	1.41	68	13	
4. Light Equip.	4	1.17	1.35	1.12	65	16	
5. Farm Equip.	1	1.16	1.22	0.91	78	14	
6. Electrodom.	1	1.44	2.77	2.29	48	10	
7. Electrical	2	1.18	1.38	1.09	87	26	
X. Transport	1	1.23	1.49	1.27	70	14	2,924
Total Manufact.	100	1.09	1.33	1.27	83	21	

Notes: VA Share = Value added in social prices for the group divided by value added in economic prices for total manufacturing.

Gross Output/Employee = Gross output in thousands of Zimbabwean dollars per employee.

We can see that while firms in Group I would have received higher value added (revenue less material input costs) in the absence of government policies, firms in Group VI benefit substantially from government policy that affects their output and material input prices.

The domestic resource costs ratios [DRCs] presented in column 4 of Table 4.2 incorporate the effects of government policies that affect the prices of labor and capital (domestic factor costs), as well as the prices of output and material inputs.

As we know, the DRC ratio is a comparative advantage or efficiency indicator which tells us the domestic resource cost of earning or saving a dollar of foreign exchange. If this ratio is less than one, it indicates that Zimbabwe has a comparative advantage in the activity, or is an efficient producer of the good. If the DRC is greater than one, it indicates that the country does not have a comparative advantage in that activity, or is an inefficient producer of the good.

The last row of Table 4.2 shows that DRC estimates average 1.27 for manufacturing as a whole. However, this average estimate is not very meaningful, since the estimates vary greatly among the ten groups and 33 activities. The DRCs range from a low of 0.88 for Groups I and II to a high of 2.41 for Group IX. Group I Foodstuffs, Group II Beverages and Tobacco Products, Group VII Chemical Products, and Group VIII Non-metallic Mineral Products have DRCs less than one, indicating comparative advantage. Group VI Paper, Printing and Publishing, and Group IX Metal and Metal Products have DRCs considerably greater than one, indicating a comparative disadvantage.

These results should not be construed as indicating that Zimbabwe has a comparative advantage in producing every good that falls in the groups with DRCs less than one, or that it does not have a comparative advantage in producing those goods that fall in groups with DRCs significantly greater than one. The results indicate great variations of the DRC estimates for products within a group and for firms manufacturing the same or similar products.

Table 4.2 shows that although Group II Beverage and Tobacco Products, has a DRC of 0.88, two of the three activities in this group (Soft Drinks and Tobacco Products) have DRCs greater than one. On the other hand, Beer, Wine and Spirits, which is the largest activity in the group, has a DRC of 0.66. These inter-product variations are also pronounced in group IX Metal and Metal Products, where the DRC for Steel and Nonferrous Metals is 3.62, whereas that for Agricultural Implements is 0.91.

The comprehensive private and economic profitability analyses carried out in Zimbabwe showed that such analyses can provide a valuable input into policy assessment and formulation. It is hoped that this handbook will promote an interest in having similar studies prepared in other countries.