Chapter Ten

Economic Prices for Tradable Goods and Services

10.1 Introduction

In the integrated financial and economic analysis, there is a need to choose a numeraire in which all costs and benefits are expressed. The most common practice has been to express all costs and benefits in terms of domestic currency at a domestic price level.[1] This is the natural rule to follow for the construction of the financial cash flow statement of a project that includes all the financial receipts and all the expenditures in each period throughout the duration of the project. However, when this numeraire is chosen to carry out the economic appraisal of the project, it is necessary to adjust the values of the transactions in the financial cash flow that involve internationally tradable goods because of distortions associated with the transactions of these goods and those that affect the market for foreign exchange.

Tradable goods and services can be either importable or exportable. In the case of importable goods that are transported from a border to a project site, additional non-tradable service charges for the project will undoubtedly be involved, such as handling charges and transportation costs, which are usually distorted in the market; thus, their values must be adjusted in the economic evaluation. Likewise, for exportable goods, where a project is considering producing its products for the export

[1] Some authors are concerned that undertaking the analysis in terms of domestic prices might not provide a sound evaluation of the projects. See Appendix 10A.

markets or using an exportable good as a project input, the financial value of the product (at factory gate) presented in the financial cash flow statement is generally determined in the world market and then net of port charges and transportation costs from the port to the domestic market. The costs of these non-tradable services are also distorted in the markets, and adjustments must be made when deriving the net economic value of the project output or project input. The evaluation of these non-tradable services from the project site to the border will be dealt with in Chapter 11.

Section 10.2 identifies the key economic characteristics of tradable and non-tradable goods. Section 10.3 describes how the financial values and various distortions should be integrated into the economic evaluation of tradable goods. Section 10.4 provides a practical example of how the economic values of various tradable project outputs and inputs can be measured. Conclusions are made in the final section.

10.2 Identification of Tradable Goods

The first step is to define the relationship between imported and importable goods, between exported and exportable goods, and between non-traded and tradable goods.

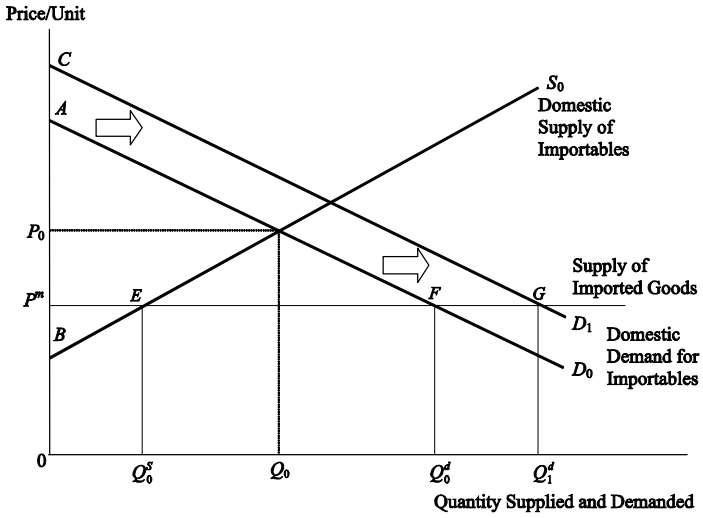
10.2.1 Imported and Importable Goods

Imported goods are produced in a foreign country but sold domestically. Importable goods include imports plus all goods produced and sold domestically that are close substitutes for either imported or potentially imported goods. The relationship between importable and imported goods can be seen in Figure 10.1, for the case of an item such as power hand tools used as a project input. Suppose the items purchased by a project are manufactured locally. At the same time, a significant quantity is also being imported. The demander's willingness to pay for this item is shown by the demand curve AD_0, while the domestic marginal cost of production is shown by the supply curve BS_0. If all imports were prohibited, then the equilibrium price would be at P_0, and the quantity

demanded and supplied would be at Q_0.

Imported goods can be purchased abroad and sold in the domestic market at a price of P^m, which is equal to the cost, insurance, and freight (CIF) price of imports converted into local currency by the market exchange rate, plus any tariffs and taxes levied on imports. This price will place a ceiling on the amount that domestic producers can charge and will thus determine both the quantity of domestic supply and the quantity demanded by consumers. When the market price is , domestic producers will maximize their profits if they produce only because at this level of output, they will be equating the market price with their marginal costs. On the other hand, demanders will want to purchase because it is at this quantity that their demand price is just equal to the world-market-determined price of . The country's imports of the good measured by the amount (−) are equal to the difference between what demanders demand and domestic producers supply at a price of .

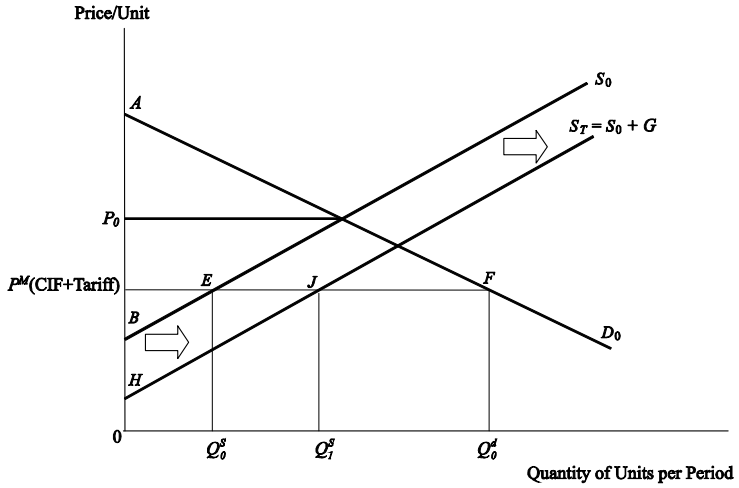
Figure 10.1: Imported and Importable Goods (the Case of Power Hand Tools Used as Project Input)



If a project now purchases the item as an input, this can be shown as a shift in its demand from AD_0 to CD_1. Unlike a situation in which there are no imports, the increase in demand does not cause the market price to rise. This is because a change in the demand for such a traded good in one country will in virtually all cases not lead to a perceptible change in the world price for the commodity. As long as the price of imports remains constant, the increase in the quantity demanded leaves the domestic supply of the good unaffected at . The ultimate effect of an increase in the demand for the importable good is to increase the quantity of imports by the full amount (−). Thus, in order to evaluate the economic cost of an importable good, we need only estimate the economic cost of the additional imports.

Likewise, the value of the benefits derived from a project that increases the domestic production of an importable good should be based entirely on the economic value of the resources saved by the decrease in purchases of imports. In Figure 10.2, the starting point is the initial position shown by Figure 10.1 prior to the project's purchase of the item. A project to increase the domestic production of these goods will shift their domestic supply from BS_0 to HS_T. This increase in domestic supply results not in a fall in price, but rather in a decrease in imports, as people now switch their purchases from imported items to domestically produced ones.

Figure 10.2: Imported and Importable Goods (the Case of Power Hand Tools Produced Domestically)

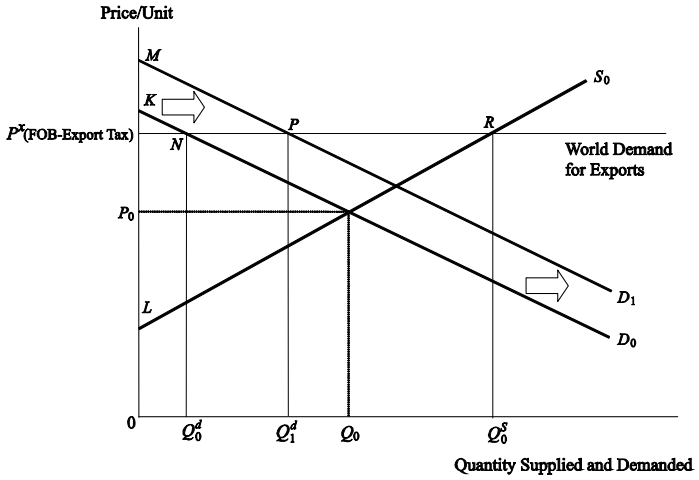


Unless the project is big enough to completely eliminate all imports of the item, the domestic price will be pegged to the price of imports, and thus the domestic demand for the input by other domestic consumers will not be changed. Imports will fall from (−) to (−), an amount equal to the output of the project (−). As domestic production serves as a one-for-one substitute for imported goods, the economic value of the resources saved by the reduction in the level of imports measures the economic value of the benefits generated by the project.

10.2.2 Exported and Exportable Goods

Exported goods are produced domestically but sold abroad. Exportable goods include both exported goods and the domestic consumption of goods of the same type or close substitutes to the goods being exported. The relationship between exportable and exported goods is very similar to that between importable and imported goods. In Figure 10.3, the demand for an exportable good is shown as KD_0, and the domestic supply of the exportable good is denoted by LS_0.

Figure 10.3: Exported and Exportable Goods (the Case of Timber Used by a Project)



If the domestic production of timber in the country cannot be exported, domestic supply and demand (Q_0) will come into equilibrium at a price of P_0. However, the commodity will be exportable so long as the domestic market price (i.e., the free on board (FOB) price multiplied by the market exchange rate less export taxes), which domestic suppliers receive when they export, is greater than P_0. If, for example, producers receive a price of (see Figure 10.3), timber production will amount to . At this price, domestic demand for timber is only ; hence, a quantity equal to will be exported.

We now introduce a project that requires timber as an input, shifting the demand for this exportable good from KD_0 to MD_1. Total domestic demand will now be equal to , leaving only (–) available to be exported. will remain constant so long as the world price is not altered by the change in demand resulting from the project. No changes in incentives have been created that would lead to an increase or

decrease in domestic supply. The measurement of the economic cost of this input to the project should be based on the economic value of the foreign exchange that is forgone when the (−) units of timber are no longer exported.

As the market price is fixed by the world price, the benefit of a project that produces such an exportable good should be measured by the value of the extra foreign exchange that is produced when the project's output is reflected in increased exports, while the costs entailed in a project's demanding more of the exportable will be measured by the economic opportunity cost (value) of the foreign exchange forgone.

All importable and exportable goods should be classified as tradable goods. Although an input might be purchased for a project from a domestic supplier, as long as it is of a type similar to ones being imported, it is an importable good and should be classified as tradable. Likewise, goods, if domestically produced and used as project inputs, and if similar to exported goods,[2] are exportable goods and are also included in tradable goods.

10.3 Economic Value of Tradable Goods and Services

10.3.1 Essential Features of an Economic Analysis

[2] It is reasonable to ask whether one should not also include an in-between category of "semi-tradables". These would, by and large, be goods whose price is influenced but not totally determined by external world-market forces. Product differentiation between imports and import substitutes, and between exports and export substitutes, would, of course, be the principal element defining the in-between category. It is our view that the insertion of a category of semi-tradables would further substantially complicate an analytical framework that is a daunting challenge to most countries (to develop a large cadre of practitioners capable of seriously applying it in practice). Our preference, therefore, is to stick with a sharp distinction between tradables and non-tradables. The aim would be to classify some semi-tradables as full tradables, thus committing errors in one direction, which it is hoped would tend to be substantially offset by classifying other semi-tradables as non-tradables, thus committing errors in the opposite direction.

The distinguishing feature of tradable goods is that changes in their demand or supply end up being reflected in the demand for or supply of foreign exchange. A project that produces more of an importable good will reduce the demand for (and therefore the amount of) imports of that good, thus reducing the demand for foreign exchange. Similarly, a project that produces more of an exportable good will ultimately add to the supply of exports and hence of foreign currency. Thus, the principal benefit of either type of project is to make additional foreign exchange available "for general use". In order to value this foreign exchange, we use the concept of the economic opportunity cost of foreign exchange (EOCFX), which states, in terms of a domestic-currency numeraire, the real economic value (in, for example, a peso or rupee country) of an incremental real dollar of foreign exchange.

We dealt with the precise measurement of EOCFX in Chapter 9. Here it is sufficient to note that: a) it is different from the real exchange rate

, which is reflected in the market foreign exchange; b) part of the difference reflects the tariff and indirect tax revenue that is given up when additional foreign exchange is extracted from the market; and c) another part of the difference reflects the tax and tariff revenue that is given up when raising the pesos or rupees that are spent in acquiring that foreign exchange.

For the present, it will be assumed that the EOCFX exceeds so that there is a positive premium on foreign exchange. The present task is to investigate the ways in which tariffs, taxes, and other possible distortions that are in some sense "specific" to the project under analysis should be dealt with.

A good way of thinking about this subject is to consider a case in which the project authority has borrowed rupees in the capital market and is then going into the foreign exchange market to buy dollars, only to have those dollars incinerated in an accidental fire. As a consequence of that accident, the economy has lost the EOCFX. This should be obvious.

However, we can also learn something from this example that is not so obvious. The EOCFX does not include any item that has something to do with the use or uses to which that foreign exchange may be put (e.g.,

by importing goods with high, medium, low, or zero import duties), or with the specific distortions that might affect projects that end up generating foreign exchange (e.g., by producing export goods that are subject to either export taxes or subsidies).

If, then, foreign exchange is used to buy an import good that is subject to a tariff , the extra tariff revenue should be considered to be a project benefit (i.e., a financial but not an economic cost). This is also the case if the same type of good is bought from a domestic producer of it, because in the end, the demand will lead to someone else increasing imports of by an equivalent amount.

If the project generates foreign exchange by producing an export good that is subject to an export tax , the extra tax revenue generated from these exports should be considered as an economic benefit, on top of the economic premium on the foreign exchange that the project generates. Here again, the benefit calculation would be the same if the project produced an equivalent exportable good that happened to be sold to domestic demanders. In this case, too, the fact that those demanders turn to the project to meet their demand implies that an equivalent amount that would have been taken by these demanders in the scenario "without" the project will now be available for export.

Import tariff rates applied to project inputs of importable goods, and export tax rates applied to the project outputs of exportable goods, are thus to be explicitly counted as project benefits. In the former case, the financial cost is greater than the economic cost by the amount of the tariff, but the economic cost must be calculated inclusive of the cost of the foreign exchange premium. In the case of the exportable output, its economic value as reflected by its FOB price is greater than the financial price by the amount of the tax. In this case, the economic price must be calculated inclusive of the foreign exchange premium. The story is reversed when it comes to project inputs of exportable goods or project outputs of importable goods. This is because when an exportable good is used by the project, less is exported, and the government loses the potential export tax. When an importable good is produced by the project, the natural consequence is that less of that good will be imported,

with a corresponding loss of tariff revenue.

Another way of stating the same case is that when an import good is used, the domestic financial price paid is probably equal to the world price plus the tariff. However, the tariff part is simply a transfer to the government, and hence should be eliminated as a component of the cost. Likewise, when an export good subject to export tax is produced, financial accounts will incorporate the receipts net of tax, but the tax is not a cost from the standpoint of the economy. As a whole, the import tariff or the export tax should be eliminated (as a cost) when moving from the financial to the economic cost–benefit exercise.

10.3.2 Valuation of Tradable Goods at the Border and the Project Site

The economic evaluation of traded outputs and inputs is a two-stage process. First, the components of the financial cost of the import or export of the good that represent resource costs or benefits are separated from the tariffs, taxes, subsidies, and other distortions that may exist in the market for the item. Second, the financial value of the foreign exchange associated with the net change in the traded goods is adjusted to reflect its economic value and is expressed in terms of the general price level (the numeraire).[3] The evaluation of projects expressed in

[3] Alternatively, an international price level could be used as the numeraire. This would require the value of non-tradable goods to be adjusted by the reciprocal of the same factor that is used to express the foreign exchange content of the project in terms of the general price level. Although some authors (such as Little and Mirrlees, 1974) have advocated carrying out the full analysis of a project's costs and benefits in terms of foreign currency (e.g., US dollars or euros), practitioners have found it very awkward to generate international prices for commonplace items such as haircuts, taxi rides, and gardeners' services. If two projects from different countries (e.g., Argentina and India) have to be compared to each other, it is easy to bring them to common terms by taking the net present value (NPV) of the Argentinian project (in real pesos) and multiplying it by the real exchange rate measure (real dollars per real peso). Similarly, one would convert the Indian project's NPV (in real rupees) into real dollars by multiplying

terms of the domestic level of prices is also for the comparability of the results between the financial and the economic appraisal.

The discussion that follows starts with the analysis for a country where there is no premium on foreign exchange. The economic evaluation of tradable goods is then carried out for the case where there is a premium on foreign exchange. These adjustments are built into the calculation of the economic value of the tradable goods and services. Following these estimations, commodity-specific conversion factors are constructed for transforming financial prices into economic values at the border.

a) Importable Goods

The financial cost of an importable input for a project can be equated to the sum of four components of the cost of an imported good, i.e., the CIF price of the imported good, tariffs/taxes and subsidies, the trade margins of importers, and the costs of freight and transportation costs from the port to the project. The sum of these four items will be approximately equal to the delivered price of the input to the project, both when the good is actually directly imported and when it is produced by a local supplier. This is illustrated in Figure 10.4. The ultimate effect of an

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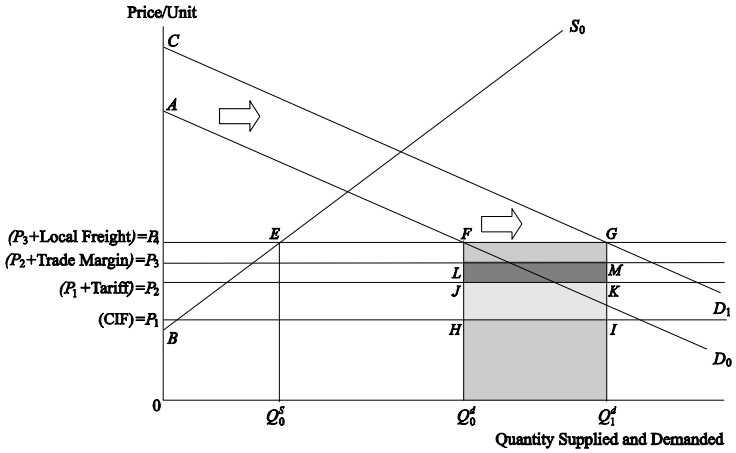
it by a measure of real dollars per real rupee. Once both NPVs are thus converted to real dollars, they are fully comparable. However, the need for such comparison is rare. It is insignificant compared to the desirability of carrying out the actual computations in real terms, in domestic currency, a procedure that is virtually a necessity if a serious analysis of stakeholder interests is to be undertaken.

increase in the demand for an importable good by a project is to increase imports by (−). The domestic value of the foreign exchange required to purchase these goods is equal to the CIF price, P_1, multiplied by the quantity (−), as denoted by the shaded area . This is part of the economic resource cost of the input because the country will have to give up real resources to the foreign supplier in order to purchase the good.

Tariffs are often levied on the CIF price of the imported good by the importing country. These tariffs are a financial cost to the project but are not a cost to the economy because they involve a transfer of income only from the demanders to the government. Therefore, tariffs and other indirect taxes levied on the imported good should not be included in its economic price.

The importer and perhaps the traders are involved in the process that brings the item from the foreign country to the final delivery at the project site. There are a number of tasks, including handling, distribution, and storage, for which the traders receive compensation. These are referred to as the trading margin. Over and above the trading margin, there are the freight costs incurred by the importer or traders to bring the item from the port or border entry point to the project.

Figure 10.4: Economic Cost of Importable Goods (the Case of Power Hand Tools Used by a Project)



The trading margins are part of the economic costs of the imported good. The financial value of the trading margin may in some cases be larger than the economic cost of the resources expended. The most obvious case of this occurs when the privilege to import a good is restricted to a few individuals through the selective issuing of import licences. In this case, the importer may be able to increase the price of the imported good significantly above the costs incurred in importing and distributing the item. These excess profits are not a part of the economic cost to the country of the imported good as they represent only income transfers from the demanders of the imports to the privileged people who obtained the import licences. Therefore, while the financial value of the trading margins of the traders is shown as the difference in the prices ($P_3 - P_2$) or the area *JLMK* in Figure 10.4, the economic cost may be less than this by the proportion of the total trade margin, which is made up of "monopoly profits".

Freight costs may vary greatly with the location of the project in the country, so it is advisable to treat these costs as a separate input. As this sector uses items that are often heavily taxed − such as petroleum products and motor vehicles − as inputs, its economic costs might be

significantly less than its financial cost.[4] If the economic cost of an importable input is to be compared with its financial price, the former will consist of the CIF price plus the economic cost of the traders' services, plus the economic cost of the freight and transportation required to bring an importable good from the port to the project.

Table 10.1 shows the breakdown of the financial cost of an imported car. In this case, the economic cost of the car is $24,400, while its financial cost is $37,600. This same evaluation of the economic price of a car also holds if instead it is the economic benefit of producing cars locally that is to be measured.

Table 10.1: Economic Cost of Importable Input: The Case of Cars

Financial Cost of Imported Car ($)	*Economic Cost of Imported Car ($)*		
CIF price	20,000		20,000
Tariff (45.0% of CIF)	9,000		-
Sales tax (10.0% of CIF)	2,000		-
Trade margin (30.0%)	6,000	(66.7% of financial cost)	4,000
Freight	600	(66.7% of financial cost)	400
Total	**37,600**	**Total**	**24,400**

We find that the ultimate effect of increasing the domestic production of a traded input is to reduce imports. The economic benefit of such an endeavour is the economic resources saved from the reduced imports. In

[4] It is more accurate to break the local freight costs down into different component costs and then calculate their economic costs.

the above example, the expectation is that a domestic producer of cars will be able to charge a price for a car of $37,600 including taxes and freight. However, the economic resources saved are equal to only $24,400. It is this amount that is equal to the economic value of a unit of domestic car production. Note that a domestically produced car, with costs equal to, say, $30,000, would be a great financial success, but in order to make it economically advisable to produce cars domestically, the cars should (in this example) have economic costs less than or equal to $24,400. If a car that was domestically produced at the project site had costs of $24,000, it would be able to compete with the imported model, even if subject to an excise tax of 45 percent on its full economic cost of $24,000, plus a sales tax of 10 percent on the same base. These together would lead to a financial "price" of $37,200. This example shows how a protective tariff can lead to inefficient domestic production (the case of a car with economic costs of $30,000) and how such inefficiency would be avoided with an equivalent tax treatment of cars, regardless of where they are produced.

The general rule is that before adjusting for the economic price of foreign exchange, the economic value of importable good production at the factory site is equal to the CIF price plus the economic cost of local freight from port to national market and then minus the economic cost of local freight from the project site to the market. By way of comparison, the economic cost of imported inputs is calculated as the sum of the CIF price at the port plus the economic cost of freight from the port to the project site.

b) Exportable Goods

Exportable goods that are used as inputs in a project typically have a financial price that is made up of the price paid to the producer, taxes, and freight and handling costs. However, it is not these items that are adjusted to measure the economic cost of the item: it is the economic benefits forgone by reduced exports that are the measure of economic cost for such an input. The country forgoes the world price (FOB at the port) when a new project buys items that would otherwise be exported. This part of the cost is not altered by the presence of export taxes or subsidies − these simply create differences between the internal price

and the FOB price, the domestic selling price at the port being higher than the FOB price in the case of an export subsidy, and lower in the case of export tax.

However, adjustments should be made for freight and handling charges. To obtain the economic benefit forgone by using an exportable good domestically, we begin with the FOB price and deduct the economic costs of the freight and the port handling charges, as these are saved when the goods are no longer exported. We then add the economic costs of freight and handling charges incurred in transporting the goods to the project. This is illustrated for the case of timber in Table 10.2.

As shown in Table 10.2, the financial cost of the timber to the project site is $495, which is made up of a $500 producer price (FOB price of $400 plus export subsidy of $100) less a financial cost differential for transportation of $50 ($125 saved plus $75 newly incurred) plus a domestic sales tax of $45. Any use of this exportable timber as an input to a local project has an economic cost of $360: this is the FOB price of $400 less the economic cost of the freight and handling charges saved of $100 on the forgone timber exports, plus the economic cost of the freight and handling in shipping the timber to the project site of $60. The assumption here is that the economic cost of freight and handling is 80 percent of its financial cost.

Table 10.2: Economic Cost of Exportable Good: The Case of Timber Used by a Project

Financial Cost of Timber ($)	*Economic Cost of Timber ($)*		
FOB price	400	FOB price	400
Plus export subsidy	100		
Producer price	**500**		
Less freight and handling, market to port	125	Less economic cost of freight and handling, market to port	100

Plus freight and handling, market to project	75	Plus economic cost of freight and handling, market to project	60
Subtotal	**450**		
Plus domestic sales tax 10%	45		
Total	**495**	**Total**	**360**

Moreover, the economic prices for tradable goods at the port should include adjustment for foreign exchange premium, while at the project they should also include the premium on outlays made to non-traded goods and services such as handling charges and transportation costs.

10.3.3 Conversion Factors for Tradable Goods at the Border and the Project Site

The economic prices of tradable goods account for the real resources consumed or products produced by a project and hence are not the same as the prices (gross of tariffs and sales taxes) paid by demanders, or the prices (gross of subsidies and net of export taxes) received by suppliers. These latter "paid or received" prices are what are designated financial prices. However, import tariffs and sales taxes, or export taxes and subsidies, associated with the importable or exportable goods are simply a transfer between the government and importers or exporters; they are not part of the economic cost or benefit.

A conversion factor (*CF*) is defined as the ratio of a commodity's economic price to its financial price. The value of the conversion factor for the importable good at the port is the commodity's economic price at the port divided by its financial price at the port. Suppose that there are tariffs and other indirect taxes such as VAT levied on the *i*th good at the rates of and , respectively. In addition, the foreign exchange premium for the country in question is *FEP*. The can then be calculated and expressed as:

$$= (1 + FEP)/[(1 + \quad)(1 + \quad)] \tag{10.1}$$

A similar formula can also be used for exportable goods in which exports are exempt from indirect taxes. Thus, for the *j*th exportable good can be calculated as follows:

$$= (1 + FEP)/(1 + \quad) \tag{10.2}$$

where stands for the subsidy (or a negative value for export tax) rate of the FOB price.

One feature of the conversion factor is its convenience, in that these ratios can be applied directly to convert a financial cash flow into an economic cost or benefit in the move from a project's financial cash flow statement to its economic benefit and cost statement. It should be noted that the above conversion factor does not incorporate any location-specific domestic handling or transportation costs from the port to the project site. When the adjustment for the impact on the economic costs of these non-tradable services for the item is made, one can obtain the economic value and the conversion factor for the tradable goods at the project site, and these can be easily incorporated as part of the total economic costs or benefits of the project.

10.4 An Illustrative Example

There are four possible cases that can be applied to measuring the economic values of tradable goods: a) an importable good is used as an input to a project; b) an importable good is produced by a domestic supplier; c) an exportable good is produced by a domestic supplier; and d) an exportable good is used as an input by a project. Examples provided below illustrate how each of the economic values and the

corresponding conversion factors of various outputs and inputs of an irrigation project in the Visayas, Philippines, are estimated (Jenkins, Pastor, and Therasa, 1994). The goal of the project was to alleviate poverty while improving the environmental sustainability of the region. The foreign exchange premium was estimated at 24.60 percent.

a) Project Uses an Importable Input (Pesticides)

In order to improve a farm's productivity, the project requires pesticides, which are importable. The financial prices of pesticides at the border include the CIF cost of the imported item plus additional costs levied on the item, such as a tariff. The CIF border price is US$166.00 per 1,000 litres, which is equal to 4,038 pesos when converted by the market exchange rate. This plus the tariff imposed on the item upon arrival at the port of Manila determines the financial prices. There is a 5 percent tariff rate on imported pesticides. Thus, the financial cost in Manila will become 4,239 pesos at the port. However, the economic cost of this imported item will include only the CIF cost, which must be adjusted by the foreign exchange premium to reflect the true cost of this input. The tariff is considered a transfer within the economy and does not represent the real economic resources used. The conversion factor for pesticides in this case is 1.19 at the port, which is calculated either by the ratio of the economic costs to the financial costs of the pesticides, as presented in Table 10.3, or by equation (10.1).

In order to find the cost of pesticide delivered to the farm gate, account must be taken of the additional costs incurred by farmers for trading, handling, and transportation from the port to Manila, the main trading centre, from Manila to the local market, and then to the project site. Adding all these costs, as presented in the second column of Table 10.3, shows that farmers will pay a total of 6,054 pesos to import 1,000 litres of pesticides to their farm gate.

The economic cost of each of the above domestic services differs from its financial cost because of various distortions involved. The estimation of these non-tradable services will be discussed fully in Chapter 11. At present, the conversion factor is assumed to be 0.70 for traders' margins and 0.90 for handling charges. In the case of transportation services, the conversion factor is assumed to be 1.20

owing to a subsidy provided to the transportation producers. As a result, the economic cost of receiving 1,000 litres of pesticides at the project site amounts to 6,767 pesos, and the conversion factor is estimated at 1.12 for pesticides. This indicates that, at the farm gate, the true economic cost of pesticides is 12 percent greater than the financial price suggests.

Table 10.3: Project Uses Importable Pesticides

	Financial Price	*Conversion Factor for Non-tradable*	*Value of FEP*	*Economic Value*
CIF world price per 1,000				
US$	166.00			
Local currency	4,038.0		993.	5,031.3
PLUS				
Tariff	201.00			0.00
Price at port	4,239.0			5,031.3
CF at port	**1.19**			
PLUS				
Handling/transportation				
Handling	540.00	0.90		486.00
Transportation	225.00	1.20		270.00
PLUS				
Traders' margin	200.00	0.70		140.00
PLUS				
Handling/transportation				
Handling	600.00	0.90		540.00
Transportation	250.00	1.20		300.00
Price at farm gate	6,054.0			6,767.3
CF at project site	**1.12**			

b) Project Produces an Import-Substitute Output (Rice)

Rice is one of the two major traded crops produced under the project for

consumption in the Philippines. The project's production is a substitute for imported rice. The price that the farmers receive for their product depends on the world rice price. Suppose that the CIF price for rice is US$314.80 per metric ton at Manila's port. Expressed in units of domestic currency, it becomes 7,659 pesos per metric ton of rice. In this case, no import tariff or taxes are levied on rice. Thus, the rice produced by the farmers could not be sold at the port for more than 7,659 pesos per metric ton, while the economic value will be measured by the economic foreign exchange saved, at 9,543 pesos. Thus, the conversion factor for rice is 1.25.

Table 10.4: Project Supplies Domestically Importable Rice

	Financial Price	*Conversion Factor for Non-tradable*	*Value of FEP*	*Economic Value*
CIF world price per ton of rice				
US$	314.80			
Local currency	7,659.0		1,884.	9,543.1
CF at the port	**1.25**			
PLUS				
Handling/transportation from				
Handling	50.00	0.90		45.00
Transportation	100.00	1.20		120.00
Traders' margin	472.00	0.70		330.40
Wholesale price in Manila	8,281.0			10,038.
LESS				
Transportation from rice	515.00	1.20		618.00
Ex-mill price of rice	7,766.0			9,420.5
LESS				
Milling cost	345.00	1.10		379.50
Pre-milled value	7,421.0			9,041.0
Paddy equivalent (65%)	4,823.6			5,876.6
LESS				
Grain dealers' margin (4%)	192.95	0.70		135.06

Handling/transportation from				
Handling	50.00	0.90		45.00
Transportation	80.00	1.20		96.00
Price of paddy at farm gate	4,500.7			5,600.6
CF at project site	**1.24**			

The traders' margins and handling and transportation costs from the port to the market in Manila will be added, and the corresponding costs for local production subtracted, in order to arrive at the farm gate price. Since rice is a substitute good, merchants in the Manila market would not pay more for the rice produced domestically from the farmers than they pay for imported rice, which is 8,281 pesos per metric ton. To find the financial price of the paddy the farmers produce, it is necessary to take into account the additional expenses they incur for milling, trading, and handling and transportation, as shown in the second column of Table 10.4. In addition, it should be noted that the value of paddy is about 65 percent that of rice. As a consequence, the financial price of paddy at the farm gate will be 4,501 pesos.

To derive the economic value of paddy that the farmers produce, the financial costs of the above services must be adjusted using the respective conversion factors estimated. After all these adjustments have been made, the total economic value of paddy will be 5,601 pesos per metric ton, and the conversion factor for import-substituted rice will be 1.24. Thus, the economic analysis indicates that at the farm gate, the true economic value of paddy is worth about 24 percent more than the financial price suggests.

c) Exportable Good (Seeds)

Seeds are produced domestically at the International Rice Research Institute (IRRI) in Manila. Suppose that the IRRI is considering increasing its production of seeds and exporting them to foreign markets. The financial price in domestic currency of seeds will be determined by the FOB price of seeds at the port of Manila, which is the world price of US$410, or 9,975 pesos per ton. If the government provides an export subsidy on seeds, its financial revenue for seeds will increase by an

equivalent amount. Suppose in this case there is an export subsidy of 10 percent of the sale price of those seeds sold abroad. The IRRI will not sell seeds to domestic buyers for less than the FOB price plus the subsidy of 998 pesos per ton, or 10,973 pesos net of port charges and transportation cost from the port of Manila to the IRRI.

The economic price of the exported product is determined by the FOB price and augmented by the foreign exchange premium to reflect the true value of this output. Thus, the economic value of exportable seeds equals 12,429 pesos at the border. As a result, the conversion factor of the exportable seeds at the port is estimated at 1.13, as presented in Table 10.5.[5]

Table 10.5: Project Supplies Exportable Seeds (Assuming Export Subsidy of 10 Percent)

	Financial Price	*Conversion Factor for Non-tradable*	*Value of FEP*	*Economic Value*
FOB price per ton of seeds				
US$	410.00			
Local currency	9,975.0		2,454.	12,429.0
PLUS				
Export subsidy (10% of FOB	998.00			
Price at port	10,973.			12,429.0
CF at port	**1.13**			
LESS				
Handling/transportation from				
Handling	120.00	0.90		108.00
Transportation	50.00	1.20		60.00
Price at IRRI gate	10,803.			12,261.0

[5] If the government instead levied an export tax on seeds of 10 percent of the FOB price, the domestic price at the port would fall to 8,977 pesos. The conversion factor would have become 1.38, according to equation (10.2).

CF at project site	**1.14**			

Suppose that the output of the IRRI increases and the additional output does not affect the world price of the seeds; their economic price delivered to the port is measured by the FOB price of the good multiplied by the market exchange rate. The FOB price will be equal to the price received by the producer plus the financial costs of handling and transportation from the IRRI to the point of export. The economic price of seeds at the IRRI will be the FOB price minus the economic costs of handling and transportation from the port to the IRRI. To arrive at the economic values of these costs, the transportation and handling charges are adjusted for the distortions using the respective conversion factors estimated. The total adjusted economic value of exportable seeds at the factory gate of the IRRI is equal to 12,261 pesos, and the conversion factor becomes 1.14.

d) Project Uses an Exportable Good (Seeds) as a Project Input

Suppose that seeds produced domestically are an exportable good and are purchased as an input to the project rather than exported abroad. If seeds can be sold for US$410 a ton on the world market, the financial price in domestic currency at the port will be 9,975 pesos per ton. Suppose in this case there is an export subsidy of 10 percent on the sale price of those seeds sold abroad. In this case, seeds will not be sold to domestic buyers for less than 10,973 pesos.

As the seeds are used by the farmers, rather than exported, the amount of foreign exchange gained by exporting the seeds is lost, and thus the economic cost will be the cost of foreign exchange earnings forgone. The economic value must be adjusted for the foreign exchange premium to become 12,429 pesos, which results in a conversion factor of 1.13, as shown in Table 10.6.

Seeds can be sold on the world market for an FOB price of 9,975 pesos. However, the IRRI receives 10,803 pesos, since it incurs 170 pesos for the transportation and handling charges from the IRRI to the port, and receives 998 pesos for the export subsidy. The IRRI will not sell rice to the farmers for less than this amount. In addition, it will

have to pay the local dealer's margin (370 pesos), plus transportation costs from the IRRI to the farm (635 pesos). There are no taxes levied on seeds in the Philippines, so the total cost that the farmers pay for their seeds amounts to 11,808 pesos per ton at the farm gate.

The total economic value of seeds at the farm gate needs to be measured in terms of the cost of the resources used in handling, transporting, and marketing the good. As these activities are non-tradable services, the economic value must be adjusted from the financial cost using the respective conversion factor. The final economic cost of 13,282 pesos for exportable seeds results in a conversion factor of 1.12.

Expressing the relationship between the economic and financial prices of an item in this way is convenient as long as the underlying tariff, tax, and subsidy distortions do not change in percentage terms; the value of the conversion factor will not be affected by inflation. Similarly, if a series of project evaluations is carried out, some of the conversion factors used for the analysis of one project may be directly applicable to others.

Table 10.6: Project Uses Exportable Seeds (Assuming Export Subsidy of 10 Percent)

	Financial Price	*Conversion Factor for Non-tradable*	*Value of FEP*	*Economic Value*
FOB price per ton of seeds				
US$	410.00			
Local currency	9,975.0		2,454.	12,429.
PLUS				
Export subsidy (10% of FOB	998.00			
Price at port	10,973.			12,429.
CF at port	**1.13**			
LESS				
Handling/transportation from				
Handling	120.00	0.90		108.00

Transportation	50.00	1.20		60.00
PLUS dealers' margin	370.00	0.70		259.00
PLUS transportation from	635.00	1.20		762.00
Price at farm gate	11,808.			13,282.
CF at project site	**1.12**			

10.5 Conclusion

This chapter began with the identification of the key distinct characteristics of tradable and non-tradable goods. It is important to point out that the fundamental forces for determining their financial price and their economic price are different. In the case of tradable goods, they are defined as including not only exported or imported goods, but also domestically consumed or produced goods, so long as they are close substitutes for exported or imported goods.

We then identified the various distortions associated with tradable goods, such as import tariffs, non-tariff barriers, export taxes, subsidies, VAT, and other indirect taxes. These distortions will have a considerable influence on the financial prices of the goods in the market. However, determining the economic prices of tradable goods and services is their world price, since the world price reflects their economic opportunity cost, or resources saved by the economy.

The economic prices of tradable goods can be estimated from the corresponding financial prices, shown in the financial cash flow statement, multiplied by the applicable commodity-specific conversion factors. The magnitudes of these conversion factors at the border depend on the size of various distortions associated with the goods in question as well as the foreign exchange premium. When the tradable goods used or produced by the project are located away from the border, non-tradable services such as handling and transportation costs, trading margins, etc. are required by the project, and their conversion factors must be estimated and incorporated into the analysis. Both their financial and their economic costs at the project site should be properly assessed and estimated in the financial and economic appraisal of the project.

Appendix 10A: Evaluating Projects Subject to Trade Protection

One of the reasons why some authors (especially Little and Mirrlees, 1974) chose to recommend that the evaluation of development projects be conducted in terms of foreign currency and at "world" prices was their fear that carrying out the analysis in terms of domestic prices would lead to the likely approval of projects that were economically unsound and that were made financially viable only as a result of protectionist measures. In this appendix we show, using numerical examples, that our analytical framework is not subject to this criticism: it will detect unsound projects without fail.

Consider first a project to produce an import substitute for men's shirts that have an external price of $20. The market exchange rate is 10 rupees to the dollar, and the foreign exchange premium is 10 percent. With a 30 percent tariff on men's shirts, the internal price of shirts will be 260 rupees. We assume here that our project is able to produce equivalent shirts domestically for 240 rupees (including a normal return to capital). The project is thus viable from a financial point of view. However, it does not pass the test of an economic evaluation.

Selling price	= Rs. 260
Reduced by 30% tariff (lost revenue to government)	−60
	Rs. 200
Augmented by 10% FEP	+20
Economic benefit	= Rs. 220
Actual cost of domestic production	Rs. 240
Net economic gain (+) or loss (-)	−Rs. 20

Consider next the case of an item subject to a 30 percent export subsidy, under the same conditions.

World price (= $20) at market exchange rate	= Rs. 200
Selling price with 30% export subsidy	= Rs. 260
Reduced by 30% export subsidy (extra outlay by government)	−60
	Rs. 200
Augmented by 10% FEP	+20
Economic benefit	= Rs. 220
Actual cost of domestic production	Rs. 240
Net economic gain (+) or loss (-)	−Rs. 20

The above examples are cases in which ill-advised protectionist measures create incentives for activities to be profitable financially, even though they represent net losses from an economic point of view. The following is an example of a project that is in fact worthwhile economically, but that will not be undertaken because an unwise export tax has made it financially unviable.

World price (= $20) at market exchange rate	= Rs. 200
Selling price net of 30% export tax (=financial return)	Rs. 140
Assumed financial cost	Rs. 180
Net financial return	−Rs. 40

Economic return	
World market price ($20) at market exchange rate	Rs. 200
Augmented by FEP	+20
	Rs. 220
Actual cost of domestic production	Rs. 180
Net economic gain (+) or loss (-)	+Rs. 40

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