Houck,

Chapter 5

Tariffs and Quotas

Tariffs and import quotas are the meat and potatoes of protective trade policy. They are the traditional mechanisms by which governments of importing nations intervene to shield their domestic producers from foreign competition. In addition, tariffs may generate sizable amounts of government revenue. Quotas, too, can be administered and allocated to create government revenue. Our main focus here will be on the protective rather than public finance aspects of tariffs and quotas, although we will not ignore the revenue side. Because they either raise the internal price of imported goods or stint the domestic market of foreign supplies, tariffs and quotas protect domestic producers of the affected items from the full force of international competition.

An import tariff is a tax on the affected foreign item, levied as it passes into the domestic economy. An import quota is a physical limit on the amount of the affected foreign item that can be imported within a specified time period. In practice, tariffs and quotas can be and are calculated, applied, and administered in endlessly complex ways. They can be used separately or together. Even though governments show amazing ingenuity in fashioning intricate tariff and quota schemes to protect domestic producers, the basic economics is relatively straightforward.

In this chapter we will look closely at the direct effects of relatively simple tariffs and quotas. Most of the common elaborations and complications do not materially alter the economic consequences of these two basic policy mechanisms. Although substantial public funds may be generated by tariffs

or quotas, we will assume generally that this is not their central purpose. Their main goal here will be to elevate internal prices of the affected goods relative to international prices.

First, we will consider the economics of fixed and ad valorem tariffs applied by both small and large trading nations. Next, we will look at the economics of import quotas in the same context. Because tariffs and quotas are similar in their market consequences and because together they are the core of trade protection by importers, we will examine the simple analytics of economic welfare changes when they are imposed. We also will consider briefly the maximum revenue tariff. Finally, we will sketch the outlines of the "optimal tariff" argument for a large trading economy.

TARIFFS

Fixed-Rate Tariff by Small Nation

Consider first the effects of a fixed-rate tariff applied by Nation A on the imports of the product q. The term "fixed-rate" means that the same import tax per unit is applied no matter how much is imported or what the international or domestic prices of the commodity are. For example, a fixed-rate tariff on a certain class of tobacco shipped into the United States might be, say, 20 cents per pound, irrespective of its market price or imported volume.

For the first analysis, consider a small nation whose imports of q, in the realistic range, cannot influence international prices. This situation is depicted in Fig. 5.1. As before, Fig. 5.1*a* reflects the domestic market and Fig. 5.1*b* the international market faced by this nation. The small-nation characteristic is reflected by the horizontal excess supply function for the rest of the world, *ES(R)*. Note that we measure imports toward the right from 0, in Fig. 5.1*b*.

If no tariffs or other trade distortions are applied by this nation in this market, the international and domestic prices are equal at p_1. Domestic producers supply an amount equivalent to *ab*, and *bc* is imported (Fig. 5.1*a*). This brings total consumption to *ac*. Fig. 5.1*b* shows imports of q equal to *df*. This is where Nation A's excess demand curve *ED* intersects *ES(R)*.

Now, for whatever reason, suppose the government decides to apply a fixed tariff to all imports of q. We show this by drawing *ED**, a vertical displacement of *ED* by the per unit amount of the tariff *T*. The function *ED** is the excess demand curve of this nation presented to the international market *after* the tariff is paid. It is a schedule of quantities demanded for import at various international prices considering the fact that a tariff must be paid. The intersection of *ED** (the tariff-burdened excess demand function) and *ES(R)* establishes the new, smaller volume of imports. That decreased import volume causes *internal* prices to increase along the original *ED* function. (As a general practice in subsequent discussions we will use an asterisk (*) to denote a func-

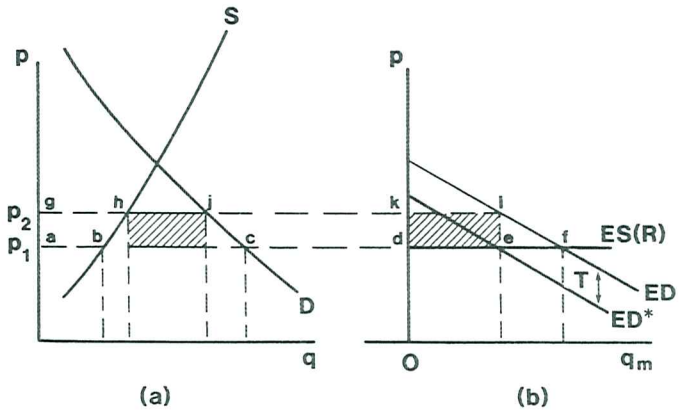

Figure 5.1 Effects of a fixed-rate tariff, small-nation case

Back to Fig. 5.1. The new international price of q is p_2. It is the world price p_1 plus the tariff T: $p_2 = p_1 + T$. The tariff makes imports of q more expensive than before. Domestic buyers in Nation A initially shun the now higher-priced imports, turning to domestic suppliers. Additional domestic supplies can be obtained only at higher prices along *S*. As prices for both imported and domestic goods increase, buyers reduce the use of both along *D*. The result is a new price equilibrium at p_2.

Because domestic supplies are expanding as domestic consumption dwindles, imports of q must fall. The new, smaller amount of imports is *kl* in Fig. 5.1*b* and *hj* in Fig. 5.1*a*. These imports bridge the narrowed gap between domestic production *gh* and domestic consumption *gj* at the higher price p_2 (Fig. 5.1*a*).

As long as imports are not snuffed out, tariff revenue is generated for the treasury. Its value is equal to the new import volume multiplied by *T*. This is the shaded area in Fig. 5.1*a* and Fig. 5.1*b*. The obvious economic consequences of this tariff other than revenue creation are a shrinkage of imports from *df* to *de*; a corresponding decrease in the total value of imports at the world price; an increase of domestic output from *ab* to *gh*; a fall in domestic consumption from *ac* to *gj*; and an increase in internal prices from p_1 to p_2. Exporters earn less gross revenue. Domestic sellers in Nation A earn more.

Whether or not domestic consumption expenditures are higher or lower with the tariff depends on the price elasticity e_D of the domestic demand function. If e_D is absolutely larger than –1.0, buyers spend less after the tariff. If e_D is absolutely less than –1.0, buyers spend more. In either case, they pay higher prices and purchase less q than they did without the tariff.

Large-Nation Tariff

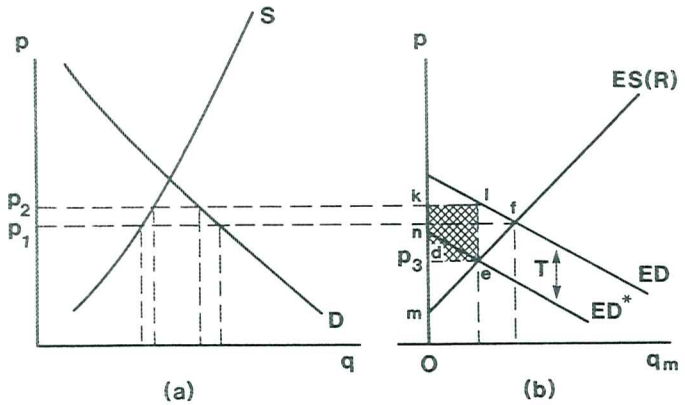

Figure 5.2 Effects of a fixed-rate tariff, large-nation case

5.2 shows such a case. It differs from the previous situation only because *ES(R)* is now positively sloped rather than horizontal in the relevant range. Hence, if Nation A increases its imports, world prices will rise. If it decreases its imports, world prices will fall.

In this case, the imposition of the tariff will have a price-increasing effect on the domestic market, as before. It also will have a depressing effect on world prices as the volume of imports into the nation shrinks from *nf* to *de*. This shrinkage of world trade volume will put downward pressure on world prices as supplies formerly destined for this nation are shifted elsewhere. In Fig. 5.2, this adjustment is indicated along *ES(R)*. The new equilibrium in the international market falls from that indicated at *f* to that indicated at *e* (Fig. 5.2*b*). The new domestic price is p_2 and the new world price is p_3. These two prices still differ from each other by *T* (the per-unit tariff value).

Because the world price falls, the domestic price increase caused by the tariff is less than if no change had occurred in the world price. The other impacts in the domestic market for *q* remain similar to those identified earlier. However, the tariff revenue is now *kled*. Importers still pay the tariff *T* as they bring *kl* units into the country, but the incidence of the tariff is shared by foreign sellers who receive lower prices and by domestic buyers who pay higher prices.

The price-changing incidence of the tariff need not be equally shared between the domestic and foreign markets. A close look at Fig. 5.2*b* reveals that the relative incidence of the tariff *T* depends on the relative absolute steepness (or price elasticity) of the *ED* and *ES(R)* functions. If both are the same in absolute slope (with *ED* negative and *ES(R)* positive), the tariff incidence will be split equally between domestic and foreign markets compared with the free trade position at *f*. If *ED* is absolutely steeper than *ES(R)*, the domestic price will rise more than the world price will fall as the tariff is imposed. On the other hand, if *ES(R)* is absolutely steeper than *ED*, the world price will fall more than the internal price will rise. These incidence effects are basically the same as with changing transfer costs between two trading nations, discussed in Chap. 4.

The United States, for example, is a very large importer of coffee, taking about 25 to 30 percent of annual world exports. If a sizable new tariff on coffee were imposed by the United States, world prices at New York would likely fall and internal prices would likely rise. The sum of the fall in world prices and the rise in domestic prices (both expressed at wholesale) would approximate the newly imposed tariff.

Tariffs imposed by large nations have relatively less protective consequences for domestic producers than identical tariffs imposed by small importers, other things being the same. This is because part of the internal price-raising impact of a large-nation tariff is dissipated in lower world prices. This effect prevents import volume from falling as much as if no international price decrease occurred. Since imports do not fall as much as in the small-nation case, tariff revenues for a fixed *T* are correspondingly higher in the large-nation case.

Tariffs so large that imports are entirely eliminated are called "prohibitive." In Fig. 5.1*b*, a tariff so high that *ED** intersects the vertical axis at or below point *d* would be prohibitive. Similarly, a tariff that pushed *ED** in Fig. 5.2 to a vertical intercept at or below point *m* would eliminate imports and thus be prohibitive.

Ad Valorem Tariff

The economic impacts and consequences of an ad valorem tariff are basically the same as with a fixed-rate tariff. The difference is in the tax levy itself. An ad valorem tariff usually is established as some percentage of the international price rather than a fixed per unit amount. Figure 5.3 shows how an ad valorem tariff displaces *ED* to *ED**. The function *ED** is the excess demand presented to the rest of the world in the presence of the ad valorem tariff. The vertical distance between *ED* and *ED** is the variable per unit value of the ad valorem tariff *T*. This value is larger at higher international prices and smaller at lower international prices, which are measured along *ED**. The intersection of *ED**

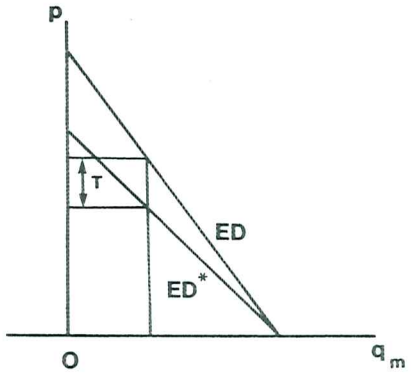

Figure 5.3 Ad valorem tariff

and the appropriate *ES(R)* establishes the international price against which the ad valorem tariff is calculated. Since *ED** lies below *ED* in both the fixed and ad valorem cases, the basic economic results are the same.

The ad valorem tariff is commonly stated as a percentage value—20 percent, 35 percent, etc.—of a readily observed international price. For example, assume that the world price of raw wool, expressed in pounds sterling, is £4.00 per kilogram and the ad valorem tariff into Great Britain is 20 percent. The tariff amount in this case is £0.80, and the internal price of cotton is £4.80 per kilogram. Should the international cotton price increase to £5.00, the tariff would increase to £1.00 per kilogram, lifting the internal price to £6.00.

QUOTAS

In the real world of international trade, tariffs have dwindled dramatically as a protective trade policy tool. Compared with the 1930s, tariffs around the trading world are becoming almost unimportant as barriers to commerce, especially for industrial products. With some exceptions, successive rounds of multilateral trade negotiations have been successful in reducing the average size and coverage of tariffs. However, ingenious nontariff barriers have been devised to achieve protection, especially in agricultural sectors.

Chief among these nontariff barriers are import quotas. While a tariff, fixed or ad valorem, directly creates a difference between international and domestic prices, the same two-price result is achieved indirectly by quantitative import restrictions. Let us look at the partial equilibrium economics of a simple import quota. Moreover, let us employ the large-nation assumption so that we can illustrate potential price effects on the international market.

A Binding Quota

An import quota enforced by the central authority has an effect on prices and trade only if it is "binding." A quota is binding when it restricts imports in a given period below the amount that otherwise would occur. Quotas are expressed as tons, bales, boxes, or pounds per year, month, or week. If the quota is larger than the volume that would be imported with free trade, it has no real effect. However, a binding quota will stint the domestic market of supplies. Prices will rise internally. Domestic producers will expand output and buyers will curtail purchases until the smaller excess demand is just balanced by the quota-determined volume of imports. In the large-nation case, the quota-induced stint of the domestic market implies a relative glut on the international market with price-depressing consequences. All of this is shown in Fig. 5.4.

The direct effect of a binding quota $\bar{q}_m$ is depicted in Fig. 5.4*b*. The original excess demand curve *ED* becomes *ED** with the intervention of a quota. At the quota amount, *ED** is completely vertical. At any international price below *d*, the amount $\bar{q}_m$ is imported. With this quota in place, the internal

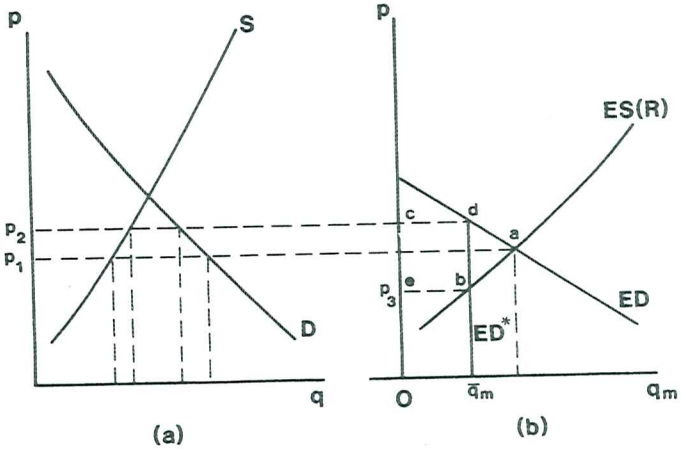

Figure 5.4 Effects of an import quota

price moves to p_2 and the world price falls to p_3, the latter being the international price at which *ES(R)* and *ED** intersect.

The overall consequences of a tariff and a quota are similar—internal prices rise, domestic production expands, domestic use declines, and world prices and imports fall. As with a tariff, the relative sizes of the domestic and international price changes depend on the absolute slopes (or price elasticities) of the excess supply and demand curves.

Quota Value

There is one important difference between a tariff and a quota. This involves the way in which a quota scheme is managed by the central authority. A market economy adapts to a consistently administered tariff more or less automatically. As prices change, output and expenditure allocations are adjusted and tax revenue flows into the treasury. However, in the case of a binding quota, the individual rights to import must be allocated in some fashion. Since these rights are scarce, they acquire value. In particular, the full per-unit value of these rights is the difference between the internal price p_2 at which imported goods are sold and the world price p_3 at which imported goods are purchased. This is shown as *db* in Fig. 5.4*b*.

Because this quota value is based solely on scarcity and not intrinsic value, it can be called economic "rent." These rents will exist as long as the overall quota is binding. The important distributional question is, who will capture them? In Fig. 5.4, the total value of quota rents is equal to area *cdbe*. If individual import quotas are distributed without charge on some basis (e.g., first-come, first-served, historical precedent, political expediency, at random), those who are fortunate enough to obtain a share in the overall quota will capture all rents available.

On the other hand, if quotas are auctioned to the highest bidders or sold

at exactly the price *bd*, the government captures the rent and the outcome is exactly as if a tariff of *bd* had been levied. Of course, intermediate solutions are possible. They involve some distribution of the rent between the issuing government and the ultimate quota holders. A partial tax (or price) on quota allocations is one such possibility.

Government Importing Board

The partial equilibrium economics of an import quota as depicted in Fig. 5.4 also can be applied to the behavior of a government-authorized importing agency or board that has complete monopoly authority to import the product q. If the board decides to import $\bar{q}_m$ and no more, it can capture all the quota rent for itself. It will make its purchases on the international market at p_3, and make its domestic sales at p_2. As long as the board does not intervene further in the domestic market, it will capture the value shown as area *cdbe* in Fig. 5.4*b*.

WELFARE IMPLICATIONS OF TARIFFS AND QUOTAS

There are at least two ways to look at the economic effects of a protective trade policy in this partial equilibrium context. One is to study the direct effects on prices, production, trade, and consumption, then to identify the groups within the society who are likely to benefit or be hurt by the intervention. This is relatively straightforward, but occasionally ambiguous. Another way is to evaluate the economic welfare changes that occur. Following this latter path requires some understanding of the concepts of consumer and producer surplus. In this section we will use both approaches with the understanding that the second approach may transcend the analytical background of some readers. However, the summary passage at the end of the section will capture the basic conclusions.

Gainers and Losers

The imposition of a tariff or an import quota will benefit some individuals and impose costs on others. These effects can be seen readily in Figs. 5.1 and 5.3. Imagine that we are considering the effects of a tariff or quota on participants in the beef market. In the first instance, a tariff or quota will benefit domestic cattle producers who obtain higher prices for more output behind the import barrier. By extension, we can argue that individuals and firms who supply productive inputs like feed and veterinary service to the protected producers will benefit because of additional demand for their products and services. Similarly, an increase in beef prices will spill over into the markets for related products like pork, lamb, poultry, and perhaps dairy products. Prices in these markets will tend to be stronger as beef prices move higher.

Domestic consumers of beef, either locally produced or imported, will

be hurt as will buyers of closely related products. They will face higher prices and, consequently, will buy less. Because import volume tends to shrink behind a tariff or a binding quota, it follows that individuals and firms who handle imported beef will lose markets and earnings. With a tariff on beef imports, the government treasury will benefit through additional revenue. However, the costs of administration and tariff collection have not been reflected in our simple graphics. They might be substantial.

When considering a binding beef-import quota, we would need to know how the allocation is handled. A free allocation will benefit those who somehow obtain the scarce import rights. They will capture all the quota rents. An auction, sale, or taxation of individual quota rights will capture at least some rent for the issuing agency, diminishing that obtained by the quota holders. In summary, the domestic gainers from a beef import restraint are cattle producers, those who supply them with inputs, producers of related products, and the government treasury or the import quota holders. The losers are consumers and, by extension, firms that handle and merchandise imports.

Though foreign suppliers are not a central topic in this analysis, we can be confident that foreign suppliers to the tariff- or quota-burdened market will lose. In the small-import-nation case, they will lose import volume only. In the large-nation case, they will both lose import volume and feel downward price pressure on all sales tied to international prices. Possible foreign gainers are consumers in nations where downward price pressure occurs because of the smaller volume of trade caused by the tariff or quota.

Although we can identify with fair certainty who gains and who loses, the relative sizes of these gains and losses and their distribution across an economy are by no means clear from this reasoning. Some additional ideas are needed. This is where producer and consumer surplus comes in.

Welfare Analysis of Tariffs and Quotas

Consumer surplus is fundamentally the net value that consumers as a group obtain by being able to purchase as much as they wish at the going market price rather than having to pay, successively, the highest price they would be prepared to offer for each additional unit. For instance, no consumer surplus for beef would occur if each buyer had to negotiate individually with a clever monopolist for every unit purchased. Such a monopolist could extract the highest price each buyer would be willing to pay for each successive unit of beef. The simplest partial equilibrium expression of consumer surplus for a product is usually taken as the area under the relevant demand curve and above the going price.

A price change will change consumer surplus. In going from p_1 to p_2 in Fig. 5.5, consumer surplus falls by the combined area $A + B + C + D$. This is the change in the area under the demand curve above the market price.

Producer surplus is fundamentally the net value obtained by owners of productive assets fixed (at least momentarily) in the sector to be analyzed. It

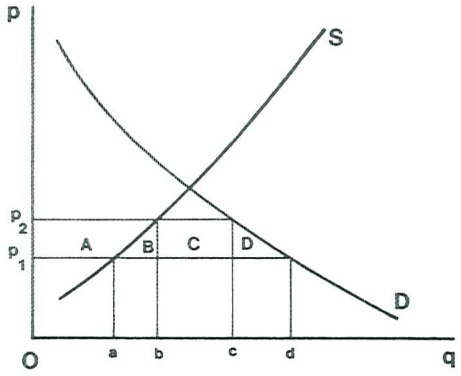

Figure 5.5 Welfare aspects of a tariff or quota

is the gross return to those assets after fully variable costs are accounted for. These assets could be land, buildings, equipment, or specialized human skills. Like consumer surplus, producer surplus is a slippery concept, but as an abstract tool of reasoning it can be useful. With the assumption that the aggregate supply curve for the product in question reflects the marginal cost of additional output, producer surplus is the area above the relevant supply curve but below the price received for output. This is so because the area under the marginal cost (supply) function represents payments to variable factors of production. Thus, the area above is the total return to all fixed factors. The partial equilibrium view of the increase in producer surplus caused by a price change from p_1 to p_2 can be identified in Fig. 5.5 as area A, the change in the area above the supply curve and below the market price.

With these ideas of producer and consumer surplus in hand, a somewhat closer analysis of tariffs and quotas can be developed. Assume that the free trade position in the q market is associated with p_1 in Fig. 5.5. In this case, $0a$ is produced domestically, ad is imported, and the total $0d$ is consumed. A tariff or a quota is introduced that raises the internal price to p_2, at which $0b$ is produced, bc is imported, and $0c$ is consumed.

This policy-induced change lowers consumer surplus from the free trade position by the amount $A + B + C + D$. This is the partial equilibrium economic cost of this change to consumers. Can we trace its distribution through the economy? Some of it, area A, is picked up as an increase in producer surplus. This value goes to owners of fixed assets that produce q. Some of it, area C, goes either to the government as tariff revenue or to import quota holders as economic rent.

Some of the value lost by consumers goes to sellers of variable inputs. This is area B. It measures the *additional* payments to variable inputs needed to attract them away from other uses into the q sector so that domestic output can expand from $0a$ to $0b$. Since resources attracted into the q industry are not available for other use, the area B reflects part of the marginal value of

output not produced elsewhere in the economy because of the expansion of q. Economists usually consider this area B to be an "efficiency" loss to the economy. This is because some production elsewhere in the economy is sacrificed to produce more q at p_2. This additional q, measured by ab in Fig. 5.5, could always be obtained via free trade at p_1.

This leaves area D to be explained. No one in the society picks up area D in redistribution. It is a "deadweight" consumption loss because consumers allocate expenditures away from the now more expensive q to other things. It is generally speaking part of the real income lost by consumers because of the price increase from p_1 to p_2, with no compensating changes occurring in other prices or in money incomes. Unlike areas A, B, and C, it cannot be traced elsewhere in the economy. It just vanishes.

This welfare analysis, abstract though it is, indicates that aside from the redistribution of A and C away from consumers to others, net losses occur in the economy. They are efficiency losses in production (B) and deadweight consumption losses (D). One can view these losses as the implicit price an economy pays for (1) the privilege of protecting the producers of q with a tariff or a quota and (2) the accumulation of tariff revenues or quota rents. Their relative sizes in any actual case depend on the magnitude of the induced price change and the price elasticities of supply and demand. The actual values may be large or small, known or unknown, but as long as p_2 is higher than p_1, these net welfare losses (sometimes called "social losses") will exist. In addition, the society imposing tariffs or quotas also must be prepared to accept the internal redistribution of economic values that occurs.

Consider again our beef import-tariff example. The consumers of beef lose economic value as internal prices, burdened by the new tariff, increase from previous levels. Part of this value is a redistribution to cattle growers and shows up as additional profits (or net returns) to beef production. Part of the lost consumer value for beef is transferred to the government treasury as tariff revenue.

As beef production expands behind the tariff, additional land, feed grains, labor, veterinary services, etc., are drawn into the cattle industry at the expense of other livestock and, possibly, crop enterprises. Part of the output value of these other commodities that are sacrificed to expand beef production is lost to the society as an efficiency loss. The remaining amount of surplus value lost by beef consumers simply vanishes as a deadweight loss as consumers' real income falls.

SELECTING A TARIFF RATE

It is probably true that existing tariff rates around the world are more or less arbitrary values. They are the net result of factors such as political compromise, historical accident, and complex international negotiation. The same is true for import quotas. However, it is possible to illustrate some abstract principles

of tariff setting to which any current practice could be compared. We will discuss two such principles here—maximum revenue tariffs and "optimal" tariffs. These principles can also be adapted to the tariff equivalent values of import quotas and quota rents. Similarly, entirely symmetric arguments can be developed for the setting of export taxes, as discussed in Chap. 12.

Maximum Revenue Tariff

Suppose that Nation A wishes to set a tariff on imported tea. This duty will protect domestic tea growers as an incidental feature, but its main purpose will be to generate revenue for the government. How should it proceed? Fig. 5.6 illustrates this question. Fig. 5.6*a* is the usual excess supply and demand picture, with the free trade import volume indicated by $\bar{q}$. Fig. 5.6*b* measures imports on the horizontal axis and tariff revenue (the tariff rate times import volume) on the vertical axis.

When free trade prevails, the tariff rate is zero. Hence, no tariff revenue is generated at $\bar{q}$. If the tariff rate is greater than $a - b$ in Fig. 5.6*a*, it is prohibitive and no imports will occur. Again, the tariff revenue is zero at point 0. In between these extremes, some tariff revenue is generated. The general result

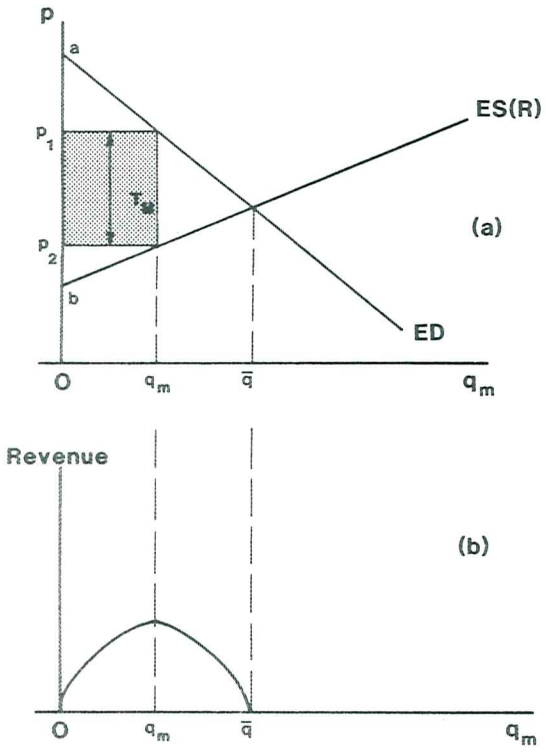

Figure 5.6 Maximum revenue tariff

is that revenue will rise and then fall as tariffs increase and imports dwindle. The place at which revenue peaks, between 0 and $\bar{q}$, is import volume associated with the maximum revenue tariff—shown as q_M in Fig. 5.6. The revenue-maximizing tariff is T_M, as indicated in Fig. 5.6*b*. The internal price is then p_1 and the world price is p_2. The exact position of q_M and the exact value of T_M naturally depend on the position and shape of the *ED* and *ES(R)* functions. If, for instance, both are straight lines, it can be shown that q_M is one-half the distance between 0 and $\bar{q}$.

Other shapes for *ED* and *ES(R)* will yield other results, but there is always a maximum revenue tariff position somewhere between 0 and $\bar{q}$. In the small-nation case, for instance, the maximum revenue tariff occurs when the ratio of the domestic price to the tariff is exactly equal to the absolute value of the price elasticity of the importing country's excess demand function.

Optimal Tariff Policy

There is another line of reasoning in trade policy economics that shows that the welfare analysis discussed earlier in this chapter is not necessarily the last word on welfare gains and losses from protective trade policy, even within the partial equilibrium context. The basic idea behind this argument is that a large importing nation can exploit its international market power via tariffs or import controls to offset (or more than offset) the combined deadweight and efficiency losses caused domestically. As it faces the rest of the trading world, a large trading nation can select an optimal tariff for its own benefit.

Consider Fig. 5.7, in which a large importing nation exhibits an excess demand function for imports of *ED* and faces a positively sloping excess supply function from the rest of the world, *ES(R)*. Point *e* is the initial, free trade equilibrium. Imagine that a tariff of $a - f$ is levied, generating the *ED** function shown in Fig. 5.7. The new international equilibrium is at *g*, and tariff revenues of *abgf* are generated as domestic prices rise, world prices fall, and imports decline.

A little study and experimentation with Figs. 5.2 or 5.4 can convince one that the shaded area *bde* in Fig. 5.7 is the sum of the tariff-induced domestic production efficiency and deadweight consumer losses—areas *B* and *D* in Fig. 5.5. Furthermore, the area *abdc* in Fig. 5.7 is equivalent to area *C* in Fig. 5.5. (Recall that *C* is the value of the consumer surplus loss redistributed to the government as tariff revenue.)

It is possible that the *additional* tariff revenue generated by pressing down the world price, area *cdgf*, can be made large enough to offset the welfare losses measured by *bde*. Figure 5.7 is drawn to suggest this. Hence the government, in principle, could use the funds from area *cdgf* to compensate for the net social losses measured by *bde* and perhaps have something left over. The more inelastic *ES(R)* is relative to the absolute price elasticity of *ED*, the more likely it is that such an optimal tariff policy can be pursued successfully. If the *ES(R)* function is completely elastic, as with the small-nation assumption, the world

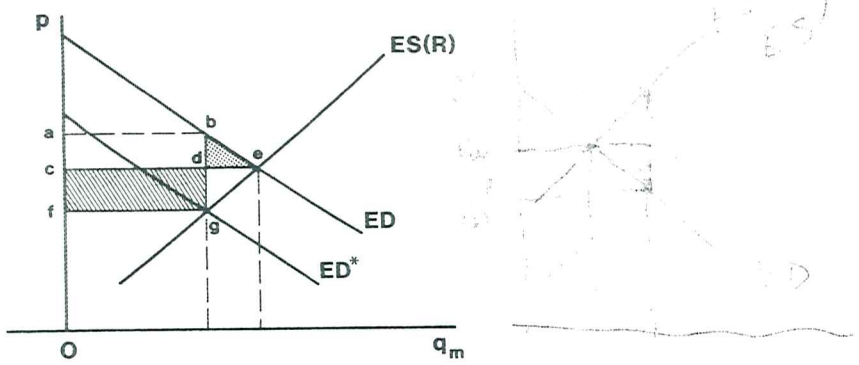

Figure 5.7 Optimal tariff selection

price cannot be pressed down by the importing country. Then the optimal tariff is zero.

The complete theory of the optimal tariff for a large nation includes rules for setting this tariff rate to maximize the difference between tariff revenues generated and the social losses caused by the tariff's adoption. No account is taken explicitly in this theory of the gains and losses sustained by foreigners as a result of the tariff. An elaboration of these topics would carry us beyond the scope of this book. However, the maximum revenue tariff and the optimal tariff are not the same. It is generally true that the optimal tariff rate is smaller than the maximum revenue tariff rate. Hence, an optimal tariff will reduce imports less than a revenue-maximizing tariff.

SUMMARY

By raising the domestic price of both imported and similar local goods, tariffs and quotas punish consumers. Tariffs act to raise internal prices and, as a result, push imports down from their nontariff volume. Quotas reduce imports directly and, as a result, stint the domestic market, causing internal prices to rise above nonquota values. The losses sustained by consumers are partially offset by gains to owners of domestic production facilities who earn higher, protected prices and expand their output. Also, gains are achieved by the government treasury with tariffs or by those who capture rent on the allocation of scarce import quotas.

In total, these sources of gain do not offset the consumers' loss. Part of this net social loss is an efficiency loss, sustained as the economy produces protected output that could otherwise be obtained on the world market at lower cost. The rest of the net social loss is called a deadweight consumer loss because of necessary consumption adjustments caused by the uncompensated price increase of the protected items.

It is possible that a large importing nation can offset part or all of these net social losses by exploiting its international market power. By driving down world prices with a tariff, the net domestic social losses can be offset by tariff revenues attributable to the decrease in world prices. The domestic social losses will still occur. Whether or not they can be offset is problematical and depends on the nation's role in the relevant international market. Maximum revenue tariffs are generally higher than the analytically more-complex optimal tariffs.

QUESTIONS

5.1 Illustrate and explain why a binding import quota on tea will insulate internal tea prices in the nation of Dorway from fluctuation caused by world market instability.

5.2 Assume that Dorway increases its annual tea import quota by 15 percent. Illustrate and discuss the welfare implications of this maneuver from the viewpoint of Dorwegian society.

5.3 To protect its domestic potato industry, the nation of Lower Magnolia has enacted a "tariff-quota." This involves a low tariff on imports if the import volume (per month) is below a fixed quota amount. However, if monthly potato imports exceed this amount, a higher tariff rate applies. Discuss and illustrate the economics of this trade policy. How would this scheme affect price fluctuations inside Lower Magnolia caused by seasonally changing excess supplies from the rest of the world?

5.4 Magnifica is a major importer of natural rubber from the international market. It has been protecting its synthetic rubber manufacturers by means of an annual, binding import quota. Individual shares of this quota are allocated to various importing firms based on historical precedent. The Magnifican government has decided to replace the quota with a tariff, but it is trying to decide whether a fixed or ad valorem tariff should be used. The new tariff will ensure the same internal protection for the synthetic rubber sector as last year. Describe the economic implications of moving from a quota to a tariff. Also outline the differences to be expected in price and import behavior depending on the kind of tariff selected as world rubber supplies fluctuate.

ADDITIONAL READINGS

Corden, W. M. 1971. *The Theory of Protection*, Clarendon Press, Oxford, England. (The partial equilibrium economics of tariffs and quotas—a bit more advanced than this book.)

Enke, S. 1944. The monopsony case for tariffs, *Quarterly Journal of Economics*, 58:229–245. (An early and quite clear exposition of the partial equilibrium basics of the optimal tariff argument.)

Grennes, T. 1984. *International Economics*, Prentice-Hall, Englewood Cliffs, New Jersey, Chaps. 7 and 8. (A broad, clear textbook presentation of tariff and quota economics, mainly the partial equilibrium approach.)

Hillman, J. 1978. *Non-tariff Agricultural Trade Barriers*, University of Nebraska Press,