

**Trade Policy and WTO Accession for Economic Development:  
Application to Russia and the CIS**

**Module 1**

**Trade Policy Principles**

by

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This module illustrates the basics of trade policy analysis. It focuses on the following questions:

- What do countries gain by trading with each other instead of opting for self-sufficiency?
- What are the main instruments of trade policy?
- How do they affect prices, output and welfare?
- What are the effects of trade policy in the presence of market imperfections?

By addressing these questions we derive the following main lessons.

*Lesson 1.* Gains from trade arise mainly because of the differences between domestic and world prices. Imports of cheaper goods than domestic substitutes expand consumption and save the resources previously used to produce them at home at a high cost. These resources can then be used to expand production and export goods the price of which is higher abroad than at home, thereby inducing further gains from trade.

*Lesson 2.* In the presence of economies of scale, gains from trade arise also in the absence of international price differences. In this case, international trade allows countries to specialise in a fewer types of goods, and therefore to produce each good in greater amount and at a lower price.

*Lesson 3.* Import protection as well as export promotion distort production and consumption decisions; therefore, they are generally welfare reducing. They also have effects on the distribution of income. Even when trade policy reduces national income and causes serious inefficiency in the economic system, it always benefits some firms or individuals at the expense of the rest of society.

*Lesson 4.* In the presence of market imperfections, such as unemployment or dynamic economies of scale, import protection may, in some cases, be welfare increasing. However, policies addressing the market imperfections directly, such as production subsidies or labour market reforms, are more effective than trade policy.

*Lesson 5.* When domestic markets are imperfectly competitive, firms have market power, which implies that their prices are too high and their output is too low. In this

case, there is an extra-benefit from trade liberalization, since it deprives domestic firms of their market power, thereby forcing them to reduce prices and expand output.

In Section 1, we show how the main welfare effects of trade policy can be analysed. In Section 2, we illustrate the main sources of gains from trade, namely, how and why international trade raises welfare. In Section 3, we examine the main trade policy instruments and discuss their welfare effects, while in Section 4 we ask whether there is scope for trade policy in the presence of externalities generated by domestic production or when markets are imperfectly competitive.

The main issues will be illustrated in very simple and intuitive terms. Boxes will instead provide a more rigorous analysis of the arguments discussed in this module.

## **1. Evaluating the effects of trade policy**

It is necessary to bear in mind that the economy of a given country is made of three aggregates of economic actors: the aggregate of producers (of agricultural and manufacturing products and services), the aggregate of consumers and the government. Any change in trade policy bears important effects on all these three components of the economy. These effects are not all in the same direction, as they could for example benefit consumers and damage producers. Therefore an appropriate welfare analysis must take into account the effects on all the three components so as to estimate the *net effect* on the economy as well as the distributional implications .

*Consumers.* The effect on consumers depends on the changes in the prices and variety of consumption goods induced by a trade policy change. In the discussion that follows we will assume, for simplicity, that goods are homogeneous, so we do not take into account the variety effect. If the price of a given product declines, then consumers can buy the same amount at a lower price. Their real income increases. Also, they are now willing to buy larger quantities than before the price change. Finally, new consumers will be willing to buy the good at a lower price. In the jargon of trade theory, these effects will generate an increase in *consumers' surplus*. Of course, a price increase will produce precisely the opposite effects, thereby reducing consumers' surplus.

*Producers.* The effect of price changes on producers is generally symmetrical to the effect on consumers. Producers benefit from an increase in the price of their products, since they get a higher revenue from selling the same amount of products. A price increase also induces them to supply a greater amount of goods. These effects translate into an increase in profits. This increase in profits loosely corresponds to what in jargon is dubbed an increase in producers' surplus.<sup>1</sup>

*Government:* the effects of trade policy on the government depend on whether the policy change increases or reduces its revenue and expenditure. For example, we will see that a tariff increases the government revenue, whereas an export subsidy increases the government expenditure.

*Net effects:* the net welfare effect of a given trade policy is the sum of the changes in producers', consumers' and government's surpluses. If a trade policy change induces a positive net welfare effect, then it increases national income, even if some economic agents may face losses.

On top of the effects taking place within a country, we must also take into account that trade policies may have effects across borders and shift resources from one country to another. Trans-boundary effects only arise when a country is sufficiently large that its policy can affect the economy of another country, for example by changing the international price of some good. Note that a country can be "large" either because of its economic size, e.g. the US, or because it is a dominant supplier/buyer of a product, e.g. the Ivory Coast in the cocoa market. Thus, in general, a country is defined as a large country when changes in its demand and/or supply of some good have a significant impact on the world price of this good. It is defined as a small country otherwise. Take the introduction of a tariff by a large country – the US - on a given product –steel. As we will show in Section 3, this measure reduces the international price of steel. As a consequence, the US can now buy steel at a lower price than before the introduction of the tariff. Hence, a large country like the US can use trade policy to improve its terms of

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<sup>1</sup> See *Box 1* for a formal definition of consumer and producer surplus.

trade. By terms of trade we mean the ratio between the price of the exported good and the price of the imported good. When the price of the imported good falls or the price of the exported good rises, the terms of trade rise in the US and fall abroad. An improvement of the terms of trade brings about a beneficial welfare effect, because it implies that a given amount of exports is now worth a greater amount of imports. By the same token, a deterioration of the terms of trade is welfare reducing, since it implies that more resources have to be used to buy foreign goods. This immediately suggests that a rise of the terms of trade in one country is equivalent to an income transfer from abroad.

## **2. Gains from trade**

*Key question: What do countries gain by trading with each other instead of opting for self-sufficiency?*

*Lesson 1.* Gains from trade arise mainly because of the differences between domestic and world prices. Imports of cheaper goods than domestic substitutes expand consumption and save the resources previously used to produce them at home at a high cost. These resources can then be used to expand production and export goods the price of which is higher abroad than at home, thereby inducing further gains from trade.

In this section we show how a move from autarchy to free trade improves the welfare of a given country. We take Russia as an example. Under autarchy, consumers can only buy domestic products and producers can only cater domestic consumers. Internal prices and quantities are determined by domestic supply and demand. Now compare autarchy to the case of free trade. Products will have to be bought and sold at the prevailing international price, which is determined by world demand and supply.

Why do domestic and international prices differ? Because countries are different from one another. In particular, countries produce similar goods at different unit costs because their technological knowledge is different or because they differ in terms of endowment, and in particular in terms of capital stock per worker and in the quality of the workforce (average level of education, professional experience, etc.). A high-income advanced country, such as the US, is abundantly endowed with physical capital and has a highly educated workforce relative to the rest of the world, and is therefore particularly good at producing sophisticated products which require an intensive use of

high-skill workers and a massive investment in research and development and in physical capital (such as aircrafts). In contrast, low-income developing countries, such as China, are relatively endowed, with respect to advanced countries, with a cheap labour force and can therefore out-compete industrial countries in those goods which require an intensive use of low-skill workers, such as traditional standardised goods (textiles, footwear, etc).

Under free trade Russian consumers, say of clothes, have the choice between Russian clothes and imported clothes and Russian producers, say of cars, can sell them in Russia and to other markets alike. Under free trade, for each product, countries can be either net importers or net exporters. They are *net importers* if at the international price the quantities demanded by domestic consumers exceed those supplied by domestic producers. Excess demand will be catered by foreign producers, by imports of socks into Russia. This case arises if, prior to trade, domestic products are more expensive than foreign products, for example because domestic producers are more efficient than foreign ones. They are *net exporters* if at the international price the quantities produced by domestic firms exceed those demanded by domestic consumers. Excess supply will be exported to foreign markets. This case arises if, prior to trade, domestic producers charge lower prices than foreign ones, for example because they are more efficient. Let us discuss both cases, assuming for now that there is no government.

*Gains from trade for a net importer under free trade.* In this case consumers gain as they can buy the same products as under autarky at a lower price. Domestic producers, either become as efficient as foreign ones or their total output declines as it gets replaced by foreign products. As prices are lower their profits will also decline. The gains of consumers, however exceed the losses of producers. The idea is that the economy as whole saves money as it buys the same products as before at a lower price. Summing up, consumers' surplus rises, producers' surplus declines and total welfare increases

*Gains from trade for a net exporter under free trade.* Here the case is symmetrical to the previous one. Producers gain as the world price is higher than the autarky price (as foreign producers are on average less efficient than domestic ones). Consequently they sell larger quantities, part of them in the world market, and their profits are higher.

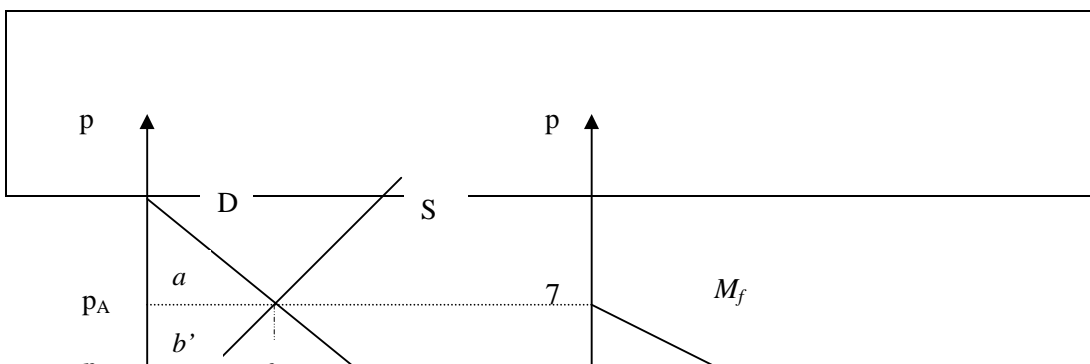
Consumer instead loose as they have now to bear the higher international price and they

will buy lower quantities. Once more, however, gains are larger than the losses as the increase in producers' surplus is larger than the decline in consumers' surplus. The intuition behind this result is that exports allow the domestic country to exploit the difference between the internal and foreign price of the good. Since the foreign price is higher, then, by contracting consumption and expanding production, the domestic country can increase its welfare. Efficient exporters have finally the opportunity to expand their output and make profits, generate surplus from this additional output sold in the world market.

Summing up, the intuition behind the gains from trade is that consumers on average spend less for the products they buy and they can use their savings to buy more products and that the resources of a given country – workers, capital etc. - previously used by inefficient producers, can be put to a better use, to increase the output of efficient producers. Overall the country gets richer as it uses its resources in a more efficient way, thus producers produce more and consumers consume more than under autarky.

**Box 1 - Gains from free imports and exports: formal analysis**

The left panel of Figure 1a depicts domestic demand ( $D$ ) and supply ( $S$ ) in a perfectly competitive industry. The autarchic equilibrium is at the intersection between the two curves and is characterized by price  $p_A$  and quantity  $q_A$ . Now consider the possibility of trading this good with the rest of the world. Assume, in particular, that the world price  $p$  is lower than or equal to  $p_A$ ; this gives rise to an import demand function equal to the horizontal distance between the domestic demand and supply functions. The import demand function ( $M_f$ ) is represented on the right panel of Figure 1a. Note that, for  $p = p_A$ , the import demand is zero, since in this case domestic supply just equals domestic demand. A lower international price induces a positive demand for imports, as it reduces domestic supply and raises demand. The international equilibrium is at the intersection between the domestic import demand function and the export supply function for the rest of the world ( $X_f^*$ ). For simplicity, the country we are studying is assumed to be small and to face a horizontal infinitely elastic export supply from the rest of the world. Therefore the world price is  $p_f$  and the country will be a net importer as far as  $p_f < p_A$  Domestic imports under free trade are then  $m_f = x_f^*$ , where  $x_f^*$  denotes foreign exports to the domestic country (henceforth, foreign variables will be denoted by an asterisk).

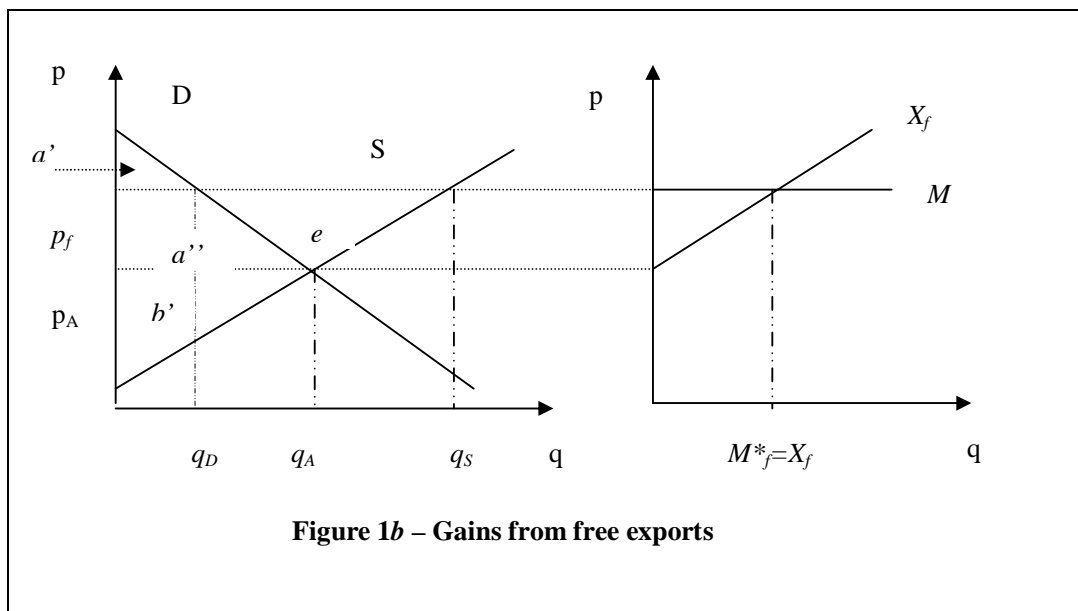


What are the welfare implications of a move from autarchy to free trade? Geometrically, *Consumer Surplus* (CS) is the area delimited by the vertical axis, the demand curve and the equilibrium price. Hence, under autarchy,  $CS_A = a$ , as shown in the figure. Similarly, *producer surplus* (PS) is the area delimited by the vertical axis, the equilibrium price and the supply curve. As shown in the figure, under autarchy,  $PS_A = b = b' + b''$ . The sum of consumer surplus and producer surplus is therefore a measure of overall welfare ( $W$ ) in an industry. Under autarchy, welfare is therefore:  $W_A = CS_A + PS_A = a + b' + b'' = a + b$ .

We can now analyze the welfare effects of free trade. As shown earlier, free trade lowers the internal price of the imported good. As a consequence, consumer surplus rises, while producer surplus falls. More precisely, under free trade consumer surplus ( $CS_F$ ) equals the area  $a + b'' + e$ , whereas producer surplus ( $PS_F$ ) equals area  $b'$ . Hence, welfare is given by  $W_F = a + b + e$ . By comparing autarchy and free imports, we conclude that:

- 1) Free imports raise domestic welfare,  $\Delta W_F = W_F - W_A = e$ .
- 2) The gains from free imports are not uniform across economic agents. In fact, consumer surplus rises partly at the expense of producer surplus, since  $\Delta CS_F = CS_F - CS_A = b'' + e$ , whereas  $\Delta PS_F = PS_F - PS_A = -b''$ .

By a similar reasoning, we can show the welfare implications of trade liberalization in exporting industries. Figure 1b makes the point. It is similar to Figure 1a. The main difference is that in this industry  $p_A < p_f$ , and hence the domestic country is an exporter under free trade. Also, if the domestic country is a small exporter in this market it faces a horizontal infinitely elastic import demand from the rest of the world  $M_f^*$ . Therefore under free trade the domestic price rises above the autarchy level. As a consequence, CS falls by the area  $a''$ , whereas producer surplus rises by area  $a'' + e$ . The net welfare effect of free exports is positive and equals area  $e$ .



**Figure 1b – Gains from free exports**

*Lesson 2.* In the presence of economies of scale, gains from trade arise also in the absence of international price differences. In this case, international trade allows countries to produce each good in greater amount and at a lower price.

The analysis carried out up to now is based on the assumption that domestic and international prices differ. However endowment-based differences are not the only source of gains from trade. *Economies of scale*, for example arising because of fixed costs are another crucial source of gains from trade: they generate gains from trade even in the absence of international price differences. Therefore, they can help explain trade among similar countries.

### 3. Instruments of trade policy

*Key questions:*

- *What are the main instruments of trade policy?*
- *How do they affect prices, output and welfare?*

*Lesson 3.* Import protection as well as export promotion distort production and consumption decisions; therefore, they are generally welfare reducing. They also have effects on the distribution of income. Even when trade policy reduces national income and causes serious inefficiency in the economic system, it always benefits some firms or individuals at the expense of the rest of society.

Governments use various instruments of trade policy to control trade flows. In this section, we describe these instruments and show how they affect trade flows, prices, production, welfare, and income distribution.

These instruments can be divided into tariff barriers (*also called price-based measures*) and *non-tariff barriers (NTB)*. The main difference between the two types of measures is that tariff barriers have a direct effect on the price of traded goods and an indirect effect on trade volumes. In contrast, non-tariff barriers have a direct effect on trade volumes and an indirect effect on prices.

The main *price-based measures* are: tariffs, export subsidies and export taxes. A tariff is a tax levied on imported goods. An export subsidy is a subsidy on the units exported of some good. Similarly, an export tax is a tax levied on exports of some good. Tariff barriers can be either *specific* or *ad valorem*. The former are independent of the value of the good (for instance, a specific tariff is a tax of 10000 roubles on imports of each French car), whereas the latter are proportional to the value of the good (for instance, an ad valorem tariff is a tax equal to the 20% of the value of an imported car). The effects of specific and ad valorem tariff barriers are essentially the same. In what follows, for expositional purposes, we will generally analyze the effects of specific tariff barriers. Finally, note that the crucial difference between a tariff and a consumption tax is that the former discriminate consumption according to its provenience, whereas the latter applies uniformly to all units consumed of some good. Similarly, an export tax (or subsidy) applies only to exported output, whereas a production tax (or subsidy) applies to all industry output.

The main *non-tariff barriers* are: import quotas, voluntary export restraints (*VER*), and technical barriers to trade. An import quota is a restriction on the quantity of some good that may be imported. The restriction is implemented by issuing import licenses. If licenses are administered by the government of the exporting country, the quota becomes, indeed, a so-called voluntary export restraint (*VER*).

Technical barriers to trade are barriers that restrict trade flows without doing so formally. For instance, governments may twist normal health and safety standards or custom procedures so as to place additional costs on foreign exporters, thereby limiting imports.

Note that price based measures and quantitative restrictions are treated in very different ways by the WTO. While the formers are generally admitted, quantitative restrictions are generally forbidden, besides for a few exceptions. We will discuss below why this is the case.

Having defined the main trade policy instruments, we can now analyse their impact on the economy introducing them. When relevant, we will also examine their effects on the rest of the world. We first discuss three price based measures, tariffs, export subsidies and export taxes and we also discuss '*Lerner simmetry*' that shows how tariffs are an implicit export tax. We then examine the effects of quantitative restrictions and other non tariff

### *3.1 Price-based measures*

In this section, we examine the effects of three price-based measures, those most frequently used in trade policy: tariffs, export subsidies and export taxes. Table 3.1 summarises their main effects, which will be discussed in details in the subsequent subsections. Following our discussion in Section 1, we study both the effects on overall welfare in the economy and on each of the following economic agents: consumers, producers and the government.

**Table 3.1. Summary of main welfare effects of price-based measures**

Instrument	Total effect on welfare	Effects on distribution		
		Change in consumers' surplus (CS)	Change in producers' surplus (PS)	Change in government net revenues (TR)
Tariff	Negative if small country <ul style="list-style-type: none"> <li>• dead weight losses in CS :                             <ul style="list-style-type: none"> <li>○ subsidy of inefficient production</li> <li>○ missed beneficial consumption opportunities</li> </ul> </li> </ul> Ambiguous if large country: <ul style="list-style-type: none"> <li>• dead weight losses in CS vs. improved terms of trade</li> <li>• worsened terms of trade in the rest of the world</li> </ul>	Negative	Positive	Positive
Export subsidy	Negative if small country <ul style="list-style-type: none"> <li>• dead weight losses in TR                             <ul style="list-style-type: none"> <li>○ subsidy of inefficient production</li> <li>○ missed beneficial consumption opportunities</li> </ul> </li> </ul> Negative if large country <ul style="list-style-type: none"> <li>• dead weight losses in TR plus worsened terms of trade</li> <li>• improved terms of trade in the rest of the world</li> </ul>	Negative	Positive	Negative
Export tax	Negative if small country <ul style="list-style-type: none"> <li>• dead weight losses in PS:                             <ul style="list-style-type: none"> <li>○ missed efficient production opportunities</li> <li>○ subsidises consumption opportunities</li> </ul> </li> </ul> Ambiguous if large country: <ul style="list-style-type: none"> <li>• dead weight losses in PS vs. improved terms of trade</li> <li>• worsened terms of trade in the rest of the world</li> </ul>	Positive	Negative	Positive

### 3.1.1. Tariffs

**Lesson 3a.** *A tariff levied by a small country distorts production and consumption decisions, reduces the welfare of consumers and raises the welfare of producers in the protected industry. The net effect on welfare is unequivocally negative.*

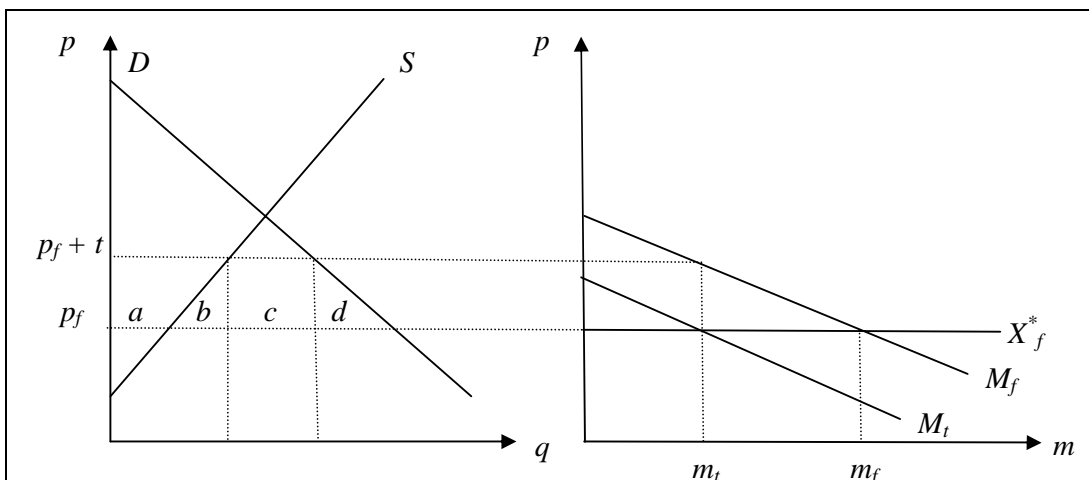
We start with the case of a small country. In this case, a tariff only alters domestic prices as it has no effects on the world market. A tariff raises domestic prices as consumers of imported products now must pay the border price plus the tariff. Consequently, consumers will revert to cheaper domestic substitutes (remember these were sold at the international price under free trade), the price of which will however rise because of the increase in demand. The end effect is that the price of domestic products is the same as the one of imported products (border price plus tariff). Consumers lose, as they have to pay higher prices. To whom does the revenue from these higher prices go? Partly to domestic producers, who now touch higher profits,

partly to the government as tariff revenue on the imported products and partly gets dissipated. Why does it get dissipated? First, because domestic producers are inefficient: higher prices cover the cost of their inability to use resources in an efficient way. Second, because consumption of the imported good is reduced and thus opportunities for beneficial consumption are lost. The loss of the consumer surplus which is transferred neither to producers, nor to the government is a dead weight loss, and represents the net welfare loss induced by a tariff.

If we now take the case of a large country, the effect of the tariff is less clear cut. It can be shown (see box 2 below) that the tariff reduces the world price of the product and thus it improves the terms of trade of the importing country. In other, words the costs of the tariff are partly discharged to the rest of the world. Even though for the importing country this gain in terms of trade partly compensates the dissipation of the consumers' rent just discussed, world welfare invariably worsens. Given that trade policy is rarely unilateral, this worsening of world trade may induce other countries to react and impose a tariff themselves, with world welfare worsening even further. But here we enter in the domain of strategic trade policy, that will be taken up at a later stage in this chapter.

***Box 2 – Welfare effects of a tariff: formal analysis***

We initially analyse the case of a small country. A small importer faces a perfectly elastic (i.e., horizontal) foreign export supply curve, as depicted in Figure 2a. Starting from the free trade equilibrium, assume that the domestic government levies a specific tariff  $t$  on imports from the rest of the world. In this case, the import demand curve shifts downwards by the amount of the tariff. The new import demand function is represented by the curve  $M_t$  in Figure 2a. The reason for the shift is that each unit of imports now costs  $t$  roubles more than in free trade. As a consequence, the import demand price falls by  $t$  in order to accommodate the tariff.



**Figure 2a – Tariffs in a small country**

The international equilibrium after the introduction of a tariff is at the intersection of the foreign export supply curve with the new import demand curve. Note that: (i) since the domestic country is small, the fall of import demand induced by the tariff has no effect on the world price of the imported good, which remains fixed at the free trade level  $p_f$ ; (ii) imports fall from  $m_f$  to  $m_t$ ; (iii) the internal price rises from  $p_f$  to  $p_f + t$ .

What are the welfare effects of the changes in industry equilibrium induced by the tariff? We have now introduced the government, so, the net welfare change ( $\Delta W_t$ ) is given by the sum of the changes in consumer surplus ( $\Delta CS$ ) and producer surplus ( $\Delta PS$ ), plus net public revenues ( $TR$ ), the tariff revenue in this case:

$$\Delta W_t = \Delta CS + \Delta PS + TR$$

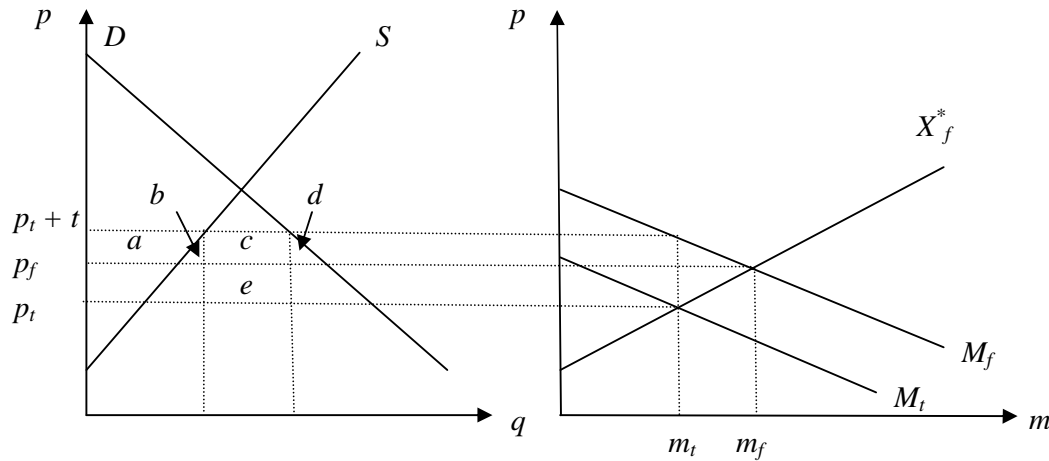
The left panel of Figure 2a illustrates the welfare effects of a tariff. In particular, by raising the domestic price from  $p_f$  to  $p_f + t$ , a tariff reduces  $CS$  by the area  $a + b + c + d$ . The price increase also raises  $PS$  by the area  $a$ . Finally, a tariff generates a fiscal revenue equal to  $tm_t$ , and hence equal to the area  $c$ . The net welfare change is therefore:

$$\Delta W_t = - (b + d) < 0$$

Areas  $b$  and  $d$  are the dead weight losses.  $b$  represents the welfare loss due to the fact that a tariff induces excess production of the imported good.  $d$  represents the welfare loss due to the fact that a tariff reduces consumption of the imported good.

Consider now the case of a large country. A country is a large importer if it faces an upward sloping export supply curve, as illustrated in Figure 2b. This implies that the reduced demand for the imported good induced by a tariff now lowers the world price of the imported good, from  $p_f$  to  $p_t$ . As a consequence, the internal price of the imported good rises by less than the full amount of the tariff, from  $p_f$  to  $p_t + t$ . The left panel of Figure 2b illustrates the welfare effects. As in the case of a small country, a tariff reduces consumer surplus (by  $a + b + c + d$ ), raises producer surplus (by  $a$ ) and

generates a fiscal revenue  $m_t$ , now equal to  $c + e$ . The net welfare change is therefore:  $\Delta W_t = - (b + d) + e$ .



**Figure 2b – Tariffs in a large country**

Note that the only difference with respect to the small country case is given by area  $e$ , which represents the terms of trade gain implied by the tariff. The net welfare change is therefore ambiguous, depending on the relative importance of the terms of trade gain with respect to the production and consumption distortion losses (i.e.,  $\Delta W_t > 0$  if  $e > b + d$ ).

### 3.1.2 Export subsidies

**Lesson 3b.** Like tariffs, export subsidies distort production and consumption decisions and raise income of producers at the expense of consumers. Unlike tariffs, however, export subsidies are costly for the government and, if the country is large, they also deteriorate the terms of trade. The net welfare effect is unambiguously negative.

Export subsidies are a money transfer from the government to producers. Consider a specific export subsidy, namely, a fixed amount granted by the government to producers for each unit of some good that is exported. Like tariffs, export subsidies increase the internal price of the exported goods. Producers will in fact cater the domestic market only if it generates the same unit revenue as the export market (the revenue from exports increases due to the export subsidy). As a consequence, producers' profits rise, partly at the expense of consumers (who pay a higher price and consume less of this good), and partly at the expense of the government (which has to pay producers for each exported unit). Like a tariff, an export subsidy also involves a waste of resources. In

fact, the country now produces too much of the exported good, thereby using resources in an inefficient way. This inefficient output increase is funded by the government through subsidies. The government will therefore have fewer resources for other uses, such as paying higher wages to civil servants, or providing better health and schooling services, etc. Also, opportunities for beneficial consumption are lost because of the higher price paid by domestic producers.

Matters are even worse when an export subsidy is used by a large country. In this case, in addition to the production and consumption distortion losses, the subsidy also induces a deterioration of the domestic country's terms of trade. The reason is that the subsidy expands the world supply of the good exported by the domestic country, and therefore depresses its world price if the domestic country accounts for a non negligible share of the world production of this good. Therefore, it is hard to justify an export subsidy from the standpoint of domestic welfare.

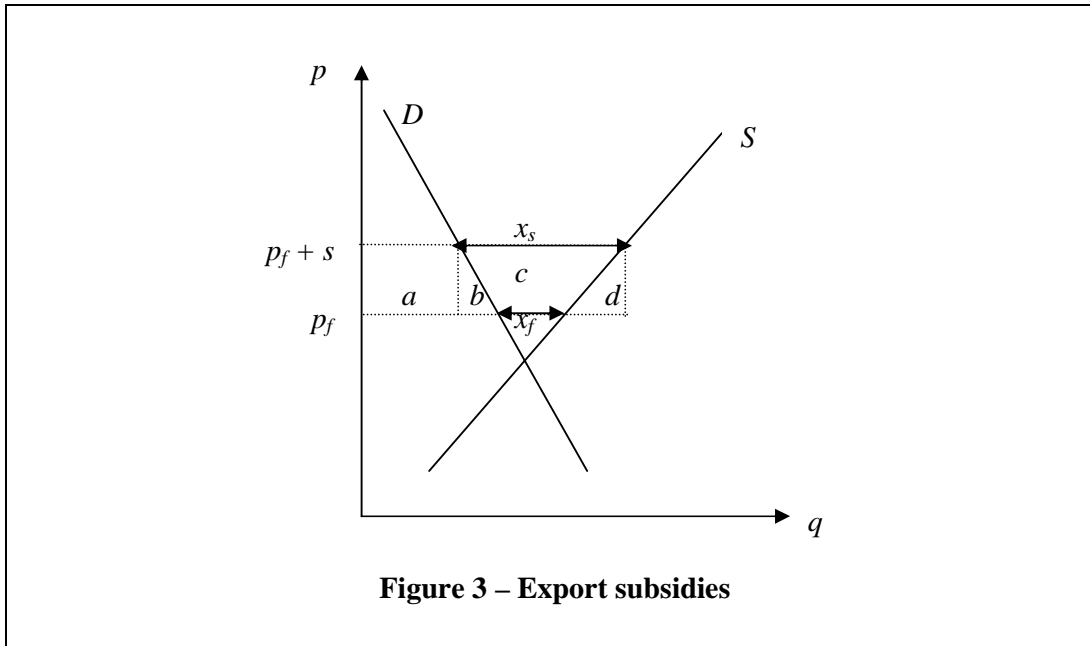
***Box 3 – Welfare effects of an export subsidy in a small country: formal analysis***

Consider an industry for which the domestic country is an exporter under free trade. Figure 3 depicts a situation in which the domestic country exports quantity  $x_f$  at price  $p_f$  under free trade. Now assume that the domestic government uses a specific export subsidy equal to  $s$ . Note that, by reducing the marginal cost of exports by  $s$ , the export subsidy expands the supply of exports. If the domestic country is small, however, the increased supply of exports has a minor effect on the world price, which remains roughly unchanged at the free trade level  $p_f$ . In the new equilibrium, exports rise from  $x_f$  to  $x_s$  and the internal price of the good rises from  $p_f$  to  $p_s + s$ . The reason for this last effect is that the export subsidy expands domestic production of the good, thereby raising its marginal cost. As a consequence, domestic consumers, who do not benefit from the subsidy, must now pay a higher price for the good.

The welfare effects of an export subsidy are straightforward. The rise of the internal price implies that consumer surplus falls by the area  $a + b$ , whereas producer surplus rises by the area  $a + b + c$ . Finally, we must take into account the cost for the government of financing the export subsidy. This cost is equal to domestic exports times the specific export subsidy ( $x_s s$ ) and is represented by the area of rectangle  $b + c + d$  in Figure q. Therefore, the net welfare change ( $\Delta W_s$ ) induced by an export subsidy is:

$$\Delta W_s = - (b + d) < 0$$

Areas  $b$  and  $d$  represent the consumption and production distortion losses, respectively. Therefore, an export subsidy is unambiguously welfare reducing when used by a small country.



### 3.1.3 Export taxes

**Lesson 3c** An export tax is a negative export subsidy. In this case producers lose and consumers and the government gain. The inefficient allocation of resources generates a loss of net welfare. Compared to free trade, domestic consumption increases whereas total production and exports decline.

A specific export tax - producers have to pay a specific amount for each unit exported - generates a decline in the domestic price. The reason is that, after the introduction of the tax, producers find it more convenient to sell in the domestic market (where there are no taxes). Supply to the domestic market increases, but consumers will buy this excess supply only if the price falls. The price keeps declining until it equals the world price net of the export tax. At the end of the adjustment process, total production and exports are lower, whereas domestic consumption is larger than under free trade. In other words, the effect of an export tax is to discourage exports in favour of production for the domestic market. Of course, producers will lose and their loss of profits will be transferred partly to consumers (who buy more of this good at a lower price), partly to the government (which obtains a revenue by taxing exports) and partly will be dissipated. Dissipation occurs for the opposite reason than in the case of an export subsidy or an import tariff: in fact, opportunities for efficient production expansion are

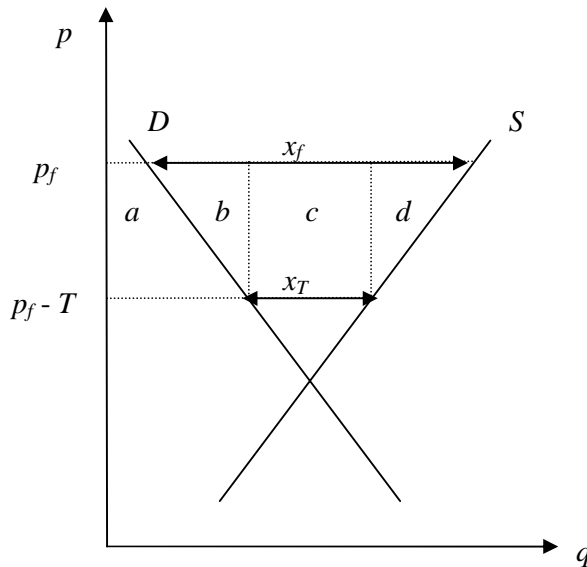
now lost, since total exports decline and therefore the gains from selling this good abroad are reduced.

**Box 4 - Welfare effects of an export tax in a small country: formal analysis**

A specific export tax  $T$  reduces the domestic supply of exports, as it increases the marginal cost of exports by the amount of the tax. If the domestic country is small the world price of the exported good remains fixed at the free trade level  $p_f$ . As a consequence, the net price received by domestic exporters falls to  $p_f - T$ , and exports fall from  $x_f$  to  $x_T$ , as shown in Figure 4. The figure also illustrates the welfare change induced by an export tax. Note that the internal price of the good also falls from  $p_f$  to  $p_f - T$ . Note that producer surplus is reduced by the area  $a + b + c + d$ , whereas consumer surplus rises by the area  $a$ . Finally, the government revenue from the export tax equals  $Tx_T$  and is represented by the area  $c$ . The net welfare change ( $\Delta W_T$ ) induced by an export tax is therefore:

$$\Delta W_T = - (b + d) < 0,$$

where  $b$  and  $d$  represent the consumption and production distortion losses induced by an export tax. Hence, an export tax unambiguously reduces the welfare of a small country.



**Figure 4 – Export taxes**

**3.1.4 Protecting import-competing industries is equivalent to discouraging exports: the Lerner symmetry**

**Lesson 3d** *An import tariff (like any other instrument of import protection) implicitly discourages the production of exportable products. Thus, it introduces an ‘anti-exports’ bias in the economy*

So far, we have discussed policy measures as if they affected price and output in only one market. Indeed, policy measures also affect, indirectly, all the other markets in the economy. For instance, import protection does not only change prices and output in import competing industries, but also in export-oriented industries. The reason is that what determines the allocation of resources among industries, i.e., in which industries people do work or firms do invest, is the *relative price* of goods and not the absolute price, as implicitly assumed so far. To see why, consider two industries, one competing with imports, e.g. Russian cars, and the other exporting abroad, e.g. Russian machine tools. A tariff on imported cars will raise the price of cars relative to the price of machine tools. This implies that profits in the car industry will rise and consequently firms and investors will be willing to put more capital in this industry than in the machine tools industry. Hence, resources – like capital and skilled labour – will be displaced from the machine tools industry to allow expansion of the car industry. As a consequence, output of the protected industry rises and that of the exporting industry falls. Specifically, it can be shown that an import protection has the same effects on the exporting industries as an export tax. Hence, an important argument against import protection is that it forces exporting industries to contract. The intuition behind this result, known as the Lerner Symmetry, is provided in *Box 5*.

**Box 5 – The Lerner Symmetry: formal analysis**

A formal proof of the Lerner Symmetry is outside the scope of this manual. However, the intuition for this result is quite simple. Divide traded goods into two groups,  $M$  and  $X$ , which represent the bundle of goods for which the domestic country is a net importer and a net exporter, respectively. Let  $P_M$  and  $P_X$  be the price indexes of these bundles under free trade. The free trade relative price of imported goods is therefore  $P_f = P_M/P_X$ . Now, consider a specific import tariff  $t$ : if the country is small, then, as shown in *Box 2*, the tariff will raise the internal price of the imported goods by  $t$ . As a consequence, the internal price of goods  $M$  will rise to  $P_M + t$ . Note, also, that a tariff also raises the relative price of imported goods to  $(P_M + t)/P_X > P_f$ , namely, above the free trade level. The allocation of resources between sectors  $X$  and  $M$  depends only on their relative price and not on absolute prices and following the tariff resources will shift from  $X$  to  $M$ . Thus, import protection, independent of its effects on the absolute price of exported goods, will force exporting industries to contract due to its effects on the relative price of these goods.

The above argument also suggests that a tariff produces the same effects as an export tax. Consider a specific export tax  $T$ : if the country is small, then, as shown in *Box 4*, it will reduce the internal price of the exported goods by  $T$ . Therefore, the internal price of goods  $X$  will fall to  $P_X - T$ . Also, like a tariff, the export tax will raise the relative price of imported goods to  $P_M / (P_X - T) > P_f$ , namely, above the free trade level. Therefore, a tariff produces the same effects as an export tax on the relative price of goods and on the allocation of resources among sectors. It follows that using tariffs to protect import-competing industries is the same as taxing exporting industries.

### *3.2 Non-tariff measures: import quotas and VERs*

***Lesson 3e.*** *Non-tariff barriers generate net welfare losses similar to those induced by a tariff, but they have different implications for income distribution.*

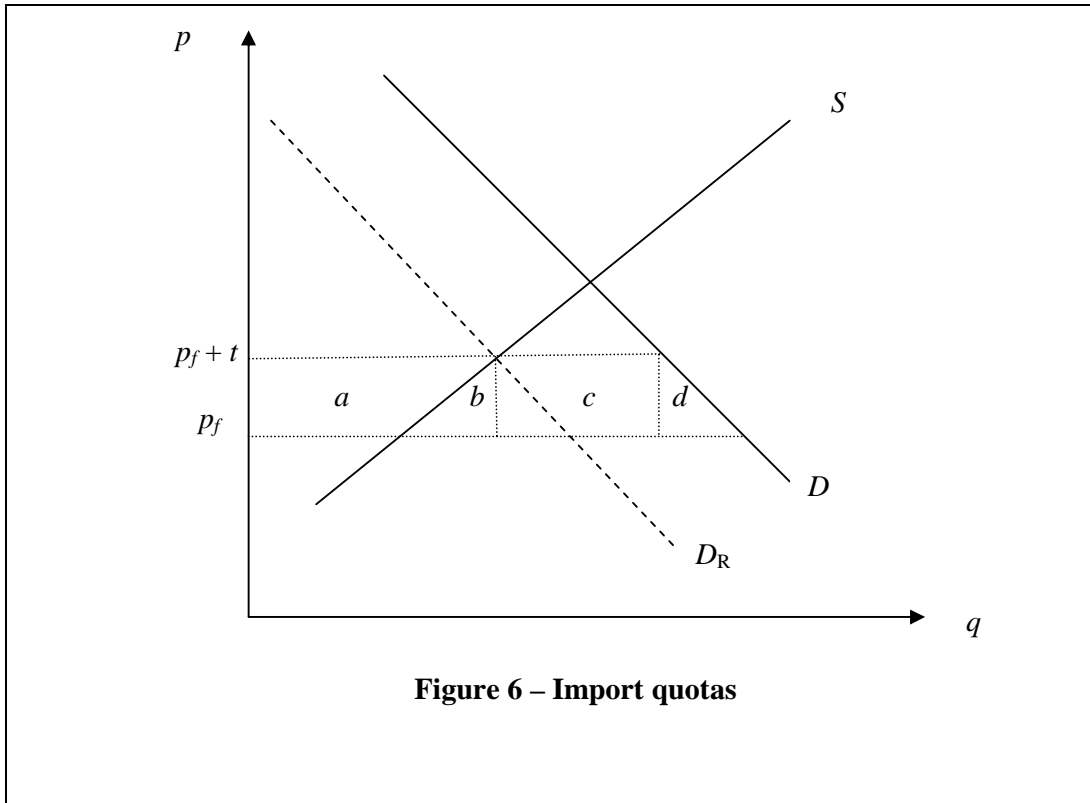
Import quotas are the main non-tariff barriers. An import quota is a quantitative restriction on imports of some good. For instance, an import quota on textile products may establish that Russia cannot import more than  $x$  meters of cotton fabric from India. Quotas are implemented by issuing licenses. The net welfare effects can be similar to those of a tariff. In fact, by restricting imports, quotas reduce access to the foreign supply of a given product. This raises the domestic price and increases the quantity supplied by domestic producers. The end result is that imports and domestic consumption decline, whereas domestic production increases. Up to here the effects are identical than those of tariffs. The main difference with respect to a tariff concerns the distribution of the rents created by a quota. The consumers' surplus is transferred partly to producers and is partly dissipated, but –and here is the difference – it is not necessarily transferred to the government, since a quota does not necessarily give rise to a revenue for the government. It all depends on the way in which import licences are administered. If licenses are granted to importers at no price, then the rent on imports (which is given by the difference between the import price in the importing country and the world price) accrues to the licence holders. If, instead, the government auctions out licenses, it can do so at a price which is precisely equal to the difference between the import price and the world price, thus it captures all the rent. The reason is that the maximum price that potential licence holders are willing to pay for the license is just equal to the rent. In this case, also the distributional effects of a quota are very similar to those of a tariff.

Under some circumstances, licenses are administered by the government of the exporting country. In this case, the foreign government issues export licenses, so that only the foreign firms which hold export licences can sell to the domestic market. This kind of arrangement is called a voluntary export restraint (*VER*), since, formally, it is the government of the exporting country that voluntarily limits its firms' exports to a given foreign. In this case, the rent is totally captured by foreign exporters or by the foreign government depending on the licensing system. Thus, a *VER* is more costly than an import quota for the domestic country, since the rent is fully appropriated by the foreign country. Some well known examples of *VERs* are the Multifibre Agreement (*MFA*), which limits exports of textiles and clothing from about twenty developing countries, and the *VER* negotiated between the US and Japan in 1981, which limited Japanese exports of autos to the US market.

In *Box 6*, we provide a more formal discussion of the effects of import quotas in the case of a small country.

***Box 6 – Welfare effects of a quota in a small country: formal analysis***

To facilitate comparison with the effects of a tariff, we consider an import quota that reduces imports by the same amount as a specific import tariff  $t$ . The dashed curve  $D_R$  in Figure 6 is the residual demand curve, obtained by shifting the demand curve horizontally by the amount of the quota. It represents the domestic demand net of the amount of the quota. Note that a quota raises the domestic price to  $p_f + t$ , where  $t$  represents the difference between the internal and international price of the good induced by a quota. The increase in the internal price causes, as usual, a fall of consumer surplus (by  $a + b + c + d$ ) and a rise of producer surplus (by  $a$ ). The only novelty with respect to a tariff is the interpretation of area  $c$ . In the case of a tariff, it is the government revenue from the tariff. Now,  $c$  is the rent associated with the holding of import licences. The reason is as follows. The holder of an import licence can buy the good at price  $p_f$  on the world market and sell it back on the domestic market at price  $p_f + t$ , thereby earning a rent equal to  $t$  for each unit of the imported good. As we have seen above, depending on how quotas are administered, their rents may accrue to the government or to other holders in the importing country or in the exporting country.



### 3.2.1 Further costs of quantitative restrictions

Article XI of *GATT* prohibits the use of *NTBs* by its members. Why does the WTO takes a tougher stance with quantitative restrictions than with tariffs? Here, we discuss three basic reasons that illustrate well why non tariff restrictions can be particularly damaging. 1) Although in theory *NTBs* can be equivalent to tariffs in terms of the degree of protection they provide to an industry, in practise they are much *less transparent*. For instance, if the domestic demand for the imported good increases over time then, unlike a constant tariff rate, a constant import quota implies a rising degree of protection. 2) If the domestic market for the imported good is *imperfectly competitive*, the equivalence between an import quota and a tariff breaks down. In particular, it is possible to show (see also Section 4.2) that a quota limits the market power of domestic firms more than a tariff and hence causes a larger efficiency loss. 3) The rents associated with the holding of import licenses may give rise to *rent-seeking* activities. A rent-seeking activity is an activity in which resources are used to gain a benefit from the government (in our case, the rent associated with the holding of a licence). This vary

from illicit actions, corruption, to more licit ways of influencing governments' decisions like lobbying. Rent-seeking activities are a cost for society, as the resources used in these activities are socially unproductive.

## **4. Trade policy under externalities and imperfect competition**

### *Key questions*

- *What are the effects of trade policy in the presence of externalities?*
- *What are the effects of trade policy in the presence of imperfect competition?*

So far, we have assumed that there are no market imperfections of any kind and that markets are perfectly competitive. These conditions are rarely met in the real world, so it is useful to see how our main results are affected in the presence of market failures and imperfect competition.

### *4.1 Externalities*

*Lesson 4.* In the presence of market imperfections, such as unemployment or dynamic economies of scale, import protection may, in some cases, be welfare increasing. However, policies addressing the market imperfections directly, such as production subsidies or labour market reforms, are more effective than trade policy.

So far it has been assumed that the private costs of production equals the social cost of production. This means that the cost for society of producing some good is the same as the cost borne by the producer. There are instances in which this is not true. The difference between private and social costs is a so-called externality. If the social cost is lower than the private one, we have positive externalities. If it is higher than private costs we have negative externalities.

An example of positive externality is when the domestic labour market does not work efficiently, so that there is unemployment due to insufficient demand for domestic output. In this case, an increase in production may reduce unemployment and allow a better exploitation of domestic resources. This implies that in this case the welfare analysis performed so far is incomplete, since it does not take into account the positive externality on the labour market generated by the output increase.

Another example of a positive externality generated by domestic production is when some industry is characterized by dynamic scale economies due, for instance, to learning-by-doing. In other words, the larger the quantity of some good produced in a country, the lower the unit costs of production of that good. This is a fairly common phenomenon, taking place, for example, when a firm adopts a new technology or a new production process. This type of externality provides ground to the so-called infant industry argument for protection. Consider a poor developing country wishing to expand its manufacturing sector. At the beginning of industrialization unit costs of production of manufacturing goods are likely to be high (or, equivalently, quality low) - albeit low wages - because of the limited experience of domestic workers and managers in manufacturing production. In this case, increasing volumes of production bring about social benefits since, by inducing learning-by-doing, they raise the productivity of the labour force and hence generate a permanent fall of unit production costs.

Therefore, when evaluating the effect of a tariff that raises domestic output we should also take into account these potentially beneficial effects. However, the use of trade policy to address these market imperfections is costly and unlikely to be effective. To make the point, compare a tariff to a production subsidy, in which case the government provides a money transfer to domestic firms for each unit of output produced (whether output is exported or sold in the domestic market makes no difference in the case of a production subsidy). A tariff creates distortions, as our reader knows well at this point, but it offsets indirectly the market imperfection, thereby possibly increasing welfare. The reason is that a tariff, by increasing the domestic output of the protected industry, allows to reap the positive externality induced, e.g., by the learning-by-doing effects. In this case, a tariff is a *second-best* measure, in that it corrects the market imperfection only indirectly by reducing trade flows, thereby inducing distortions in the economic system, such as an increase in the internal price and a consequent fall in domestic consumption. On the other hand, a production subsidy is a *first-best* instrument, namely, a policy measure that addresses the market imperfection directly. The reason is that a production subsidy allows to increase domestic production without inducing a rise of domestic prices and therefore without reducing domestic consumption. To conclude, in the presence of positive externalities generated by the domestic production of some

good, a production subsidy is preferred to a tariff (or a quota), because it allows to reap the positive externalities without introducing distortions in the economic system.

To conclude, even in the presence of market failures, such as dynamic scale economies or unemployment, governments should refrain from using trade policy to correct market imperfections, since trade policy is very costly in terms of distortions and achieves its goal only indirectly. In contrast, governments should try, if possible, to hit the market imperfection directly by using first-best instruments. For instance, if the rate of unemployment is too high, then the policy maker should implement measures that improve the functioning of the labour market, rather than using trade policy to protect employment levels in import-competing industries.

The welfare effects of a tariff and a production subsidy are analysed more formally in *Box 7* below.

***Box 7 – Tariffs versus production subsidies in the presence of externalities***

Figure 7 depicts the supply and demand curves in the domestic country, which we assume to be small. The only novelty is the curve  $S_s$ , which represents the social marginal cost of production. Note that the curve lies below the standard supply curve  $S$ , which reflects the private marginal cost. The reason is that, because of dynamic scale economies or imperfections in the labour market, domestic production brings about a social benefit which reduces the marginal cost for society below the private marginal cost. Under free trade domestic production is at  $S_0$ . This output level equals  $p_f$  to the private marginal cost, which is higher than the social marginal cost, and hence is too low from the standpoint of social welfare. In fact, area  $h$  in the figure shows that, because of the positive externalities generated by domestic production, welfare would be increased by an expansion of production from  $S_0$  to  $S_1$ . This welfare increasing expansion of domestic production is impossible under laissez-faire, since domestic producers do not take externalities into account (they only care of their private costs and benefits). This gives rise to a potentially useful role for the policy maker. But then the question is: which policy instrument is best suited to raise output from  $S_0$  to  $S_1$ ?

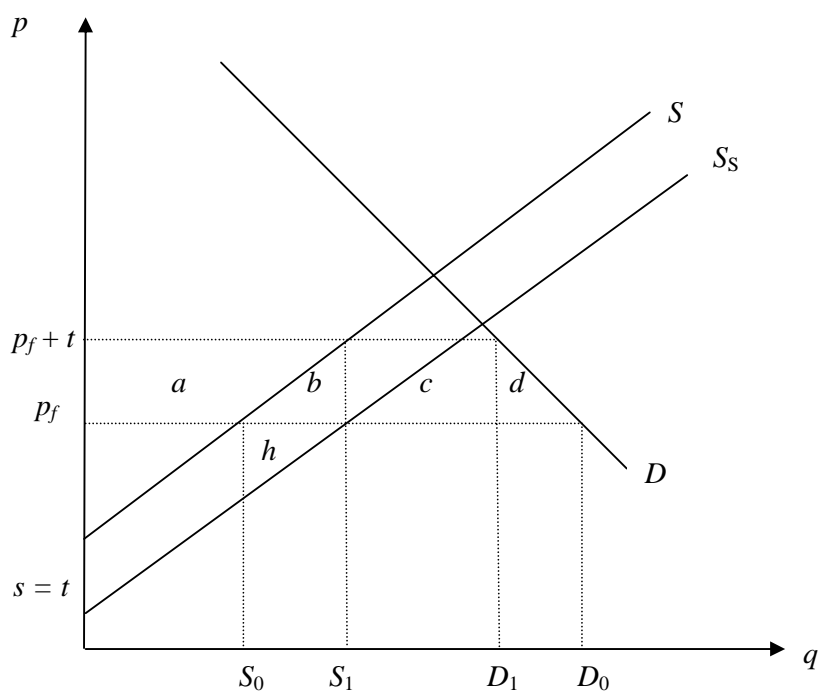
Consider first a trade policy measure, e.g., a specific tariff  $t$ . As we already know, the tariff raises the domestic price to  $p_f + t$ , thereby increasing domestic production to  $S_1$  and reducing domestic consumption from  $D_0$  to  $D_1$ . The only novelty with respect to the analysis of the effects of a tariff performed earlier is that, in addition to the standard welfare loss  $(b + d)$ , we must also take into account the welfare gain  $h$ , namely, the positive output externality. The net welfare effect of a tariff in the presence of externalities ( $\Delta W_t^e$ ) is therefore:

$$\Delta W_t^e = -(b + d) + h$$

which can be greater than zero if externalities are strong enough.

Consider now an industrial policy measure, e.g., a specific production subsidy  $s = t$ . The subsidy shifts the supply curve  $S$  downwards, since it reduces the private marginal cost by  $s$ . As a consequence, the private marginal cost now equals the social marginal cost and hence domestic production equals  $S_1$  under free trade. Therefore, like a tariff, by raising domestic output a production subsidy allows to reap the gain represented by area  $h$ . Unlike a tariff, however, a subsidy does not raise the internal price, which stays constant at the free trade level  $p_f$ . As the production subsidy does not distort consumption, it allows to save the distortion represented by area  $d$ , and hence its net welfare effect ( $\Delta W_{ps}^e$ ) is:

$$\Delta W_{ps}^e = -b + h.$$



**Figure 7 - Externalities**

#### 4.2 Imperfect competition

*Lesson 5.* When domestic markets are imperfectly competitive, firms have market power, which implies that their prices are too high and their output is too low. In this case, there is an extra-benefit from trade liberalization, since it deprives domestic firms of their market power, thereby forcing them to reduce prices and expand output.

When markets are imperfectly competitive, trade liberalization brings about additional gains from trade due to its pro-competitive effect. This means that competition from abroad reduces domestic firms' market power and may even force them to behave as perfectly competitive firms (i.e., as price takers). Imagine the extreme case in which there is just a monopolist in the domestic market. It is well known that, unless challenged by the government's anti-trust regulation, a monopolist can charge high prices and make large profits at the expense of domestic consumers. When trade is liberalised, the monopolist now faces the competition of imported substitutes. If the international market is sufficiently large and competitive, the monopolist will face the world price like a perfectly competitive producer. Consequently, welfare increases because trade liberalization eliminates the inefficiencies due to monopoly power by domestic firms.

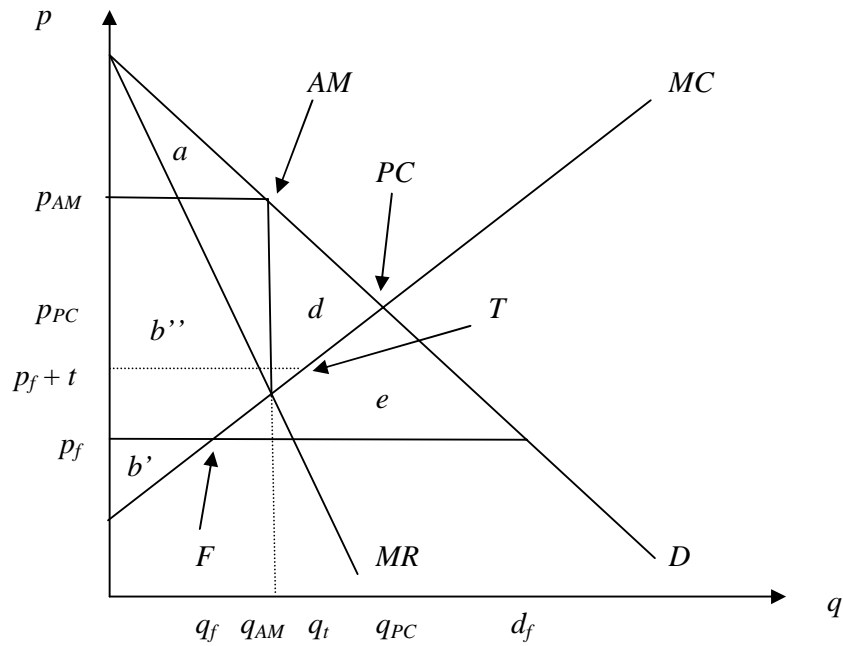
It can also be shown that in the presence of imperfect competition, import protection pursued through the use of a tariff is less costly in terms of welfare than in the case of an import quota. The reason is that a tariff, unless it is too high, allows competition from abroad and – as shown in *Box 8* – it may even force the domestic monopolist to behave as a competitive firm by setting a price close to its unit cost of production. In contrast, in the case of a quota, a monopolist is insulated from foreign competition for that part of domestic demand which cannot be served by foreign producers (the so-called residual demand) and can therefore set a price much higher than its unit production cost. This may help explain the efforts within the *WTO* to turn member countries' quotas into tariffs (the so-called tariffication) so as to reduce to the overall distortions induced by protectionism.

***Box 8 – The pro-competitive effect of trade liberalization***

Figure 8 depicts the case in which the domestic output is produced by only one firm. Under autarky, the domestic firm behaves as a monopolist. *MC* is the marginal cost curve for the monopolist, whereas the curve *MR* is its marginal revenue (the increase in total revenue induced by selling an additional unit). A monopolist produces too little at a higher price than under perfect competition. In particular, the output level under an autarkic monopoly is  $q_{AM}$ , i.e., at the intersection between marginal cost and marginal revenue. Equilibrium is therefore at point  $AM = (q_{AM}, p_{AM})$ . In contrast, under perfect competition the supply curve for the industry equals the marginal cost curve and therefore equilibrium is at point  $PC = (q_{PC}, p_{PC})$ , where output is higher and the price lower relative to the monopoly equilibrium. The area of triangle *d* is the so-called

deadweight loss induced by the domestic monopolist. It represents the welfare loss due to the fact that the monopolist prices above marginal cost.

Welfare under an autarkic monopoly equals  $W_{AM} = a + b' + b''$ , where  $a$  is the consumer surplus and  $b = b' + b''$  is the monopolist's surplus. Now consider a move from autarchy to free trade. Assume that the domestic monopolist is small relative to the world market, so that it takes the free trade price ( $p_f < p_{AM}$ ) as given. In this case free trade turns the domestic monopolist into a price taker, behaving as a perfectly competitive firm. Hence, under free trade the domestic monopolist produces at point  $F = (q_f, p_f)$ , where the free trade price intersects the marginal cost curve (otherwise, demand for its product would fall to zero). The excess demand,  $d_f - q_f$ , is now served by imports at price  $p_f$ . Therefore, consumer surplus rises by  $b'' + d + e$ , whereas the monopolist's surplus falls by  $b'$ . The gains from free trade are given by:  $W_f - W_{AM} = d + e$ . By comparing Figure 8 with Figure 1a on the gains from free imports under perfect competition, note that in the presence of imperfectly competitive markets free trade brings about additional gains from trade, since it also eliminates the deadweight loss  $d$  implied by the fact that domestic firms have market power under autarchy.



**Figure 8 - Monopoly**

Assume now that the domestic government levies a small specific tariff  $t$  (i.e., such that  $p_f + t < p_{PC}$ ); in this case the pro-competitive gains from trade are not lost. The reason is that a tariff, while allowing the monopolist to raise its price, still forces it to price at marginal cost (in terms of Figure 8, it produces at point  $T = (q_t, p_t + t)$ ). It follows that the welfare cost of a small tariff is the same as under perfect competition.

**Further Readings**

Krugman, P. and M. Obstfeld (2003). *International Economics: Theory and Policy*, Sixth Edition, Addison Wesley (chapters 8-11).